

FLORA OF SOUTHERN AFRICA

VOLUME 5

Editor G. Germishuizen



Part 1

Fascicle 1: Aloaceae (First part): Aloe

by H.F. Glen and D.S. Hardy



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FLORA OF SOUTHERN AFRICA

which deals with the territories of

SOUTH AFRICA, LESOTHO, SWAZILAND, NAMIBIA AND BOTSWANA

VOLUME 5

PART 1

FASCICLE 1: ALOACEAE (FIRST PART): ALOE

by

H.F. Glen and D.S. Hardy

Scientific editor: G. Germishuizen

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Pretoria
2000

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Cover illustration:

The South African 10-cent piece in use from 1965 to 1989 had a depiction of *Aloe aculeata* on the reverse. Cythna Letty made the original painting from which the coin was designed. The illustration on the cover is derived (by removal of the figures of value) from a digital photograph of this coin by John Bothma, first published in Hern (1999, *Hern's handbook on South African coins & patterns*, published by the author, Randburg). Reproduced by kind permission of J. Bothma.

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NEW TAXA, NEW COMBINATIONS AND NEW STATUSES
PUBLISHED IN VOLUME 5, PART 1, FASCICLE 1 (FIRST PART)

- Aloe dichotoma* Masson var. **ramosissima** (Pillans) Glen & D.S.Hardy, comb. et stat. nov., p. 142
Aloe microstigma Salm-Dyck subsp. **framesii** (L.Bolus) Glen & D.S.Hardy, comb. et stat. nov., p. 107
Section **Aristatae** (A.Berger) Glen & D.S.Hardy, stat. nov., p. 31
Section **Asperifoliae** (A.Berger) Glen & D.S.Hardy, stat. nov., p. 76
Section **Chabaudia** Glen & D.S.Hardy, sect. nov., p. 88
Section **Haemanthifoliae** (A.Berger) Glen & D.S.Hardy, stat. nov., p. 23
Section **Latebracteatae** (A.Berger) Glen & D.S.Hardy, stat. nov., p. 85
Section **Longistylae** (A.Berger) Glen & D.S.Hardy, stat. nov., p. 25
Section **Macrifoliae** (Haw.) Glen & D.S.Hardy, stat. nov., p. 92
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Section **Principales** (A.Berger) Glen & D.S.Hardy, stat. nov., p. 114
Section **Superpositae** (Pole Evans) Glen & D.S.Hardy, stat. nov., p. 73

INTRODUCTION

This part was compiled in accordance with the Guide for contributors to the *Flora of southern Africa* (compiled by Leistner, Ross & De Winter and available from the Editor, National Botanical Institute, Private Bag X101, Pretoria, 0001 South Africa).

Some maps show the distribution of the various taxa outside the *FSA* region as well.

The numbering of the genus is according to De Dalla Torre & Harms in their *Genera siphonogamarum* (1900–1907), as adapted by Arnold & De Wet (1993, *Plants of southern Africa: names and distribution*).



DAVID SPENCER HARDY
24 September 1931 – 31 May 1998

ALOEACEAE

by H.F. GLEN* and D.S. HARDY**

Perennial herbs, shrubs or trees, usually with fusiform roots, rarely with bulbs. *Leaves* rosulate, 3- or 5-ranked or rarely distichous, succulent, linear to deltoid. *Inflorescence* spicate, racemose or capitate, simple or branched, apparently axillary. *Flowers* 6-merous, usually pedicellate, regular, bilabiate or gasteriform. *Perianth* cylindrical to trigonous, sometimes with a basal swelling, straight or curved, red, orange, yellow, whitish, greenish, bicoloured or tricoloured; segments in two series, free or connate. *Stamens* inserted at base of ovary, with included or exerted anthers. *Ovary* trilocular, superior; style 1, included or exerted; ovules many in each locule. *Fruit* a loculicidal capsule or rarely a berry. *Seeds* tetrahedral, brown or black, variously winged.

Genera in this family are similar not only in their gross morphology but also in anatomy, cytology and chemistry. The family is linked to Asphodelaceae by the genus *Kniphofia*, which is similar to *Aloe* in some respects but resembles core Asphodelaceae in others.

A family of six genera, about 475 species; all genera except *Aloe* endemic to southern Africa. We regard *Lomatophyllum* (14 species, Madagascar and Mascarenes) as a section of *Aloe*.

1026000

ALOE

Aloe L., Species plantarum: 319 (1753) pro parte; Baker: 302 (1896a); A.Berger: 159 (1908); Reynolds: 103 (1950); R.A.Dyer: 928 (1976). Type species: *A. perfoliata* L.

Catevala Medik.: 67 (1786) pro parte. Type species: none cited. Name rejected for *Haworthia* Duval.

Kumara Medik.: 69, t. 4 (1786). Type species: *K. disticha* Medik., nom. illegit.

Rhipidodendron Willd.: 164 (1811). Type species: none cited.

Pachidendron Haw.: 35 (1821). Type species: none cited.

Bowiea Haw.: 122 (1827) pro parte. Type species: *B. africana* Haw.

Busipito Salisb.: 76 (1866). Type species: none cited.

Pryas Salisb.: 76 (1866) (apparently a nom. nov. for *Kumara* Medik.).

Chamaealoe A.Berger: 130 (1908); Oberm.: 119 (1973). Type species: *C. africana* (Haw.) A.Berger.

Leptaloe Stapf: t. 9300 (1933); E.Phillips: 186 (1951). Type species: *L. albidia* Stapf.

Aloinella (A.Berger) A.Lemée: 27 (1939). Type species: *A. haworthioides* (Baker) A.Lemée.

Perennial herbs, shrubs or trees, usually with fusiform roots, rarely with bulbs. *Leaves* succulent, linear to deltoid, margins usually dentate, surfaces rarely with prickles. *Inflorescence* spicate, racemose or capitate, simple or branched, apparently axillary. *Flowers* 6-merous, usually pedicellate, regular, slightly irregular or rarely bilabiate. *Perianth* cylindric to trigonous, sometimes with a basal swelling, usually straight (if curved then without a basal swelling), red, orange, yellow, whitish or rarely greenish, often bicoloured; segments in two series, free or connate. *Stamens* with included or exerted anthers. *Ovary* trilocular, superior; style 1, included or exerted; ovules many in each locule. *Fruit* a loculicidal capsule. *Seeds* tetrahedral, brown or black, variously winged.

* National Botanical Institute, Private Bag X101, Pretoria, 0001 South Africa.

** Late of the National Botanical Institute, Private Bag X101, Pretoria, 0001 South Africa.

- 1a Sterile bracts on peduncles absent, or subtending only inflorescence branches, or very few:
 - 2a Plants caulescent:
 - 3a Inflorescence racemose:
 - 4a Raceme horizontal to oblique, secund 21. Sect. Ortholophae (p. 121)
 - 4b Raceme erect, symmetrical:
 - 5a Leaves distichous 26. Sect. Kumara (p. 145)
 - 5b Leaves spirally arranged 15. Sect. Macrifoliae (p. 92)
 - 3b Inflorescence paniculate:
 - 6a Stems simple, rarely several from base; racemes usually secund, or if not then dense, longer than 500 mm 21. Sect. Ortholophae (p. 121)
 - 6b Stems branched; racemes symmetrical, lax, shorter than 500 mm:
 - 7a Leaves biconvex in transverse section to shallowly canaliculate, less than 7 times as long as wide; flowers yellow 24. Sect. Dracaloae (p. 139)
 - 7b Leaves deeply canaliculate, over 7 times as long as wide; flowers pink 25. Sect. Aloidendron (p. 143)
 - 2b Plants stemless:
 - 8a Outer perianth segments free for half or more of their length:
 - 9a Racemes secund 21. Sect. Ortholophae (p. 121)
 - 9b Racemes symmetrical:
 - 10a Anthers and style exerted more than 2 mm 12. Sect. Asperifoliae (p. 76)
 - 10b Anthers and style included or exerted less than 2 mm 13. Sect. Latebracteatae (p. 85)
 - 8b Outer perianth segments connate for half or more of their length:
 - 11a Leaves aristate, with hairlike prickles arising from white tubercles 4. Sect. Aristatae (p. 31)
 - 11b Leaves not aristate, lacking prickles and tubercles:
 - 12a Leaves with spots in transverse bands; perianth inflated around ovary 9. Sect. Pictae (p. 50)
 - 12b Leaves with longitudinal stripes, or if spotted then spots irregularly placed and perianth not inflated around ovary:
 - 13a Perianth trigonously indented 14. Sect. Chabaudia (p. 88)
 - 13b Perianth not indented 10. Sect. Paniculatae (p. 68)
 - 1b Sterile bracts plentiful on peduncles:
 - 14a Anthers and styles exerted more than 2 mm:
 - 15a Perianth segments connate in lower half:
 - 16a Pedicels longer than 13 mm 11. Sect. Superpositae (p. 73)
 - 16b Pedicels shorter than 13 mm:
 - 17a Plants caulescent, erect 23. Sect. Pachydendron (p. 131)
 - 17b Plants stemless or stems decumbent:
 - 18a Leaves rough; plants indigenous to Northern Cape, Namibia and Angola 12. Sect. Asperifoliae (p. 76)
 - 18b Leaves smooth; plants indigenous to KwaZulu-Natal, Northern Province, Mpumalanga and Zimbabwe 22. Sect. Pachythamnos (p. 126)
 - 15b Perianth segments free to base:
 - 19a Pedicels up to 12 mm long:
 - 20a Plants caulescent:
 - 21a Perianth tubular; flowers pedicellate 19. Sect. Principales (p. 114)
 - 21b Perianth campanulate; flowers sessile to subsessile 20. Sect. Anguialoe (p. 115)

- 20b Plants stemless:
 - 22a Perianth campanulate 20. Sect. Anguialoe (p. 115)
 - 22b Perianth tubular:
 - 23a Leaves without scattered surface prickles and shorter than 150 mm 6. Sect. Proliferae (p. 37)
 - 23b Leaves with scattered surface prickles, or if without prickles then longer than 150 mm 3. Sect. Longistylae (p. 25)
- 19b Pedicels 12 mm long or longer:
 - 24a Perianth shorter than 15 mm 3. Sect. Longistylae (p. 25; *A. chlorantha*)
 - 24b Perianth longer than 15 mm:
 - 25a Leaves spotted or with longitudinal stripes 17. Sect. Purpurascens (p. 104)
 - 25b Leaves unspotted and without longitudinal stripes:
 - 26a Plants unbranched, erect 11. Sect. Superpositae (p. 73)
 - 26b Plants with branched stems; if unbranched, then stems pendent 18. Sect. Arborescentes (p. 109)
- 14b Anthers and styles included or exerted less than 2 mm:
 - 27a Leaves linear, strap-shaped or subulate, if deltoid then plant with a bulb:
 - 28a Leaf margins with teeth longer than 1 mm; leaves up to 5 times as wide as thick 5. Sect. Echinatae (p. 32)
 - 28b Leaf margins entire or with teeth shorter than 1 mm; leaves over 5 times as wide as thick:
 - 29a Leaves fibrous; margins entire 2. Sect. Haemanthifoliae (p. 23)
 - 29b Leaves not fibrous; margins usually minutely dentate 1. Sect. Leptoaloe (p. 4)
 - 27b Leaves lanceolate to deltoid (plants without bulbs):
 - 30a Leaves spotted or with longitudinal stripes:
 - 31a Leaves 3-ranked; margins cartilaginous 8. Sect. Serrulatae (p. 46)
 - 31b Leaves rosulate; margins not cartilaginous:
 - 32a Perianth constricted at mouth 17. Sect. Purpurascens (p. 104)
 - 32b Perianth not constricted at mouth 7. Sect. Rhodacanthae (p. 40)
 - 30b Leaves without lines and spots:
 - 33a Inflorescence shorter than 500 mm, corymbose 16. Sect. Aloe (p. 99)
 - 33b Inflorescence longer than 500 mm, racemose:
 - 34a Stems solitary, erect 11. Sect. Superpositae (p. 73)
 - 34b Stems branched, if solitary then pendent 18. Sect. Arborescentes (p. 109)

A genus of some 350 species, occurring in Africa, Madagascar, Arabia, the Canary Islands and the Comoro Islands, with one species, *Aloe vera* (L.) Burm.f., naturalised in the Caribbean and in South America. In southern Africa as treated here, there are 119 indigenous species. Most if not all of the nonsouthern African species have been cultivated from time to time in southern Africa. Some, such as *A. camperi* Schweinf., are not only very common in cultivation but are occasionally found in disturbed places as garden escapes.

Aloe may be distinguished from *Kniphofia* by its succulent leaves, and apparently axillary, often branched inflorescences. Most species of *Aloe* can be separated from *Haworthia* by habit; all can be separated by the symmetry of the flower. Many species of *Aloe* are caulescent, but all species of *Haworthia* are stemless, and most species of *Aloe* are larger than all species of *Haworthia*. In *Aloe* the flowers are (almost) regular with three-fold symmetry, or irregular with a single plane of symmetry. In *Haworthia* the flowers are bilabiate, with one, two or four planes of symmetry. *Aloe* is distinguished from *Gasteria* by the flowers. The flowers of *Gasteria* are very ventricose with

upturned mouths; in *Aloe* the flowers are usually not ventricose, and do not have swellings as marked as in *Gasteria* or upturned mouths in ventricose flowers. These two genera are further distinguished by leaf colour (almost always pale green or glaucous in *Aloe*; those of *Gasteria* are dark green to almost black), leaf tubercles (absent in *Aloe*, present in *Gasteria*) and flower colour. No species of *Aloe* has the tricoloured flowers that are common in *Gasteria*, and the particular shade of pink that is characteristic of flowers of *Gasteria* is unknown in *Aloe*. The minor genus *Astroloba* differs from *Aloe* in its habit (no *Aloe* has 5-ranked leaves on elongate stems) and bilabiate flowers. The flower characters that separate *Aloe* and *Haworthia* also separate *Aloe* and *Chortolirion*, but the latter genus has a distinctly bulbous rootstock not found in *Haworthia*.

Note: the keys presented here do not take hybrids into account and should not be expected to work with material of hybrid origin.

1. Section **Leptoaloe**

Section **Leptoaloe** A.Berger in Das Pflanzenreich 33: 164 (1908); Reynolds: 120 (1950). Type species: *A. ecklonis* Salm-Dyck.

Section *Graminialoe* Reynolds: 104 (1947a); Reynolds: 110 (1950). Type species: *A. myriacantha* (Haw.) Roem. & Schult.

Plants stemless or rarely caulescent; roots usually fusiform, rarely bulbous. *Leaves* linear to deltoïd, sometimes deciduous, less succulent than those of other sections of the genus, distichous to rosulate, margins usually dentate, rarely entire. *Inflorescence* a simple, rarely branched, capitate to elongate raceme; peduncle with many sterile bracts. *Flowers* red, pink, salmon or yellow; perianth regular or zygomorphic. *Anthers* and stigmas included or shortly exserted.

1a Bracts ovate:

2a Plants caulescent:

3a Plants erect:

4a Plants solitary; leaves distichous; flowers orange 15. *A. fouriei*

4b Plants in clumps; leaves rosulate; flowers yellow 10. *A. dominella*

3b Plants prostrate or pendent:

5a Leaves \pm 7 per rosette, relatively narrow 12. *A. soutpansbergensis*

5b Leaves \pm 16 per rosette, broader 13. *A. nubigena*

2b Plants stemless or almost so:

6a Leaves distichous:

7a Leaves deep green; inner perianth segments dorsally adnate to outer; bracts acute 14. *A. verecunda*

7b Leaves bright green; inner perianth segments free; bracts acuminate:

8a Raceme sublaex; conical; perianth red to salmon-pink; leaves keeled; capsule grey 21. *A. cooperi*

8b Raceme dense; capitate; perianth yellow; leaves not keeled; capsule buff 17. *A. linearifolia*

6b Leaves rosulate:

9a Plants in clumps:

10a Leaves up to 16 per clump; flowers whitish:

11a Bracts \pm 11 mm long, longer than pedicels 2. *A. albida*

- 11b Bracts \pm 7 mm long, as long as pedicels 1. *A. saundersiae*
- 10b Leaves 20 or more per clump; flowers yellow; bracts as long as pedicels 10. *A. dominella*
- 9b Plants solitary:
 - 12a Raceme lax; plant with a bulb 5. *A. kniphofioides*
 - 12b Raceme dense or subdense; plant without a bulb:
 - 13a Plants over 350 mm tall:
 - 14a Bracts shorter than pedicels; perianth orange to red; plants indigenous to Northern Province 16. *A. vossii*
 - 14b Bracts as long as pedicels; perianth pink; plants indigenous to Eastern Cape and KwaZulu-Natal 20. *A. micracantha*
 - 13b Plants up to 300 mm tall, often much smaller:
 - 15a Perianth mouth upturned; bilabiate:
 - 16a Plant over 200 mm tall; leaves canaliculate 3. *A. myriacantha*
 - 16b Plant up to 100 mm tall; leaves not canaliculate 2. *A. albidia*
 - 15b Perianth mouth straight; symmetrical:
 - 17a Leaves up to 175 \times 3 mm; plants up to 75 mm tall 1. *A. saundersiae*
 - 17b Leaves 220 \times 4 mm or larger; plants over 200 mm tall 4. *A. minima*
- 1b Bracts deltoid:
 - 18a Plants with bulbs:
 - 19a Leaves over 300 mm long, deltoid; plants from northern Namibia or tropical Africa 8. *A. buettneri*
 - 19b Leaves up to 200 mm long, linear to lorate; plants from KwaZulu-Natal, Mpumalanga or Northern Province:
 - 20a Leaf margin entire; flowers yellowish green, scented 6. *A. modesta*
 - 20b Leaf margin denticulate; flowers grass-green, not scented 7. *A. inconspicua*
 - 18b Plants without bulbs; roots fusiform:
 - 21a Leaves linear:
 - 22a Raceme cylindric; flowers sessile; bracts longer than pedicels 22. *A. bowiea*
 - 22b Raceme capitate; flowers distinctly pedicellate; bracts as long as pedicels:
 - 23a Leaves glaucous; bracts acuminate 9. *A. chortolirioides*
 - 23b Leaves bright green; bracts acute 10. *A. dominella*
 - 21b Leaves lorate to ensiform:
 - 24a Leaf margins entire 18. *A. integra*
 - 24b Leaf margins minutely denticulate:
 - 25a Plants erect; leaves erect to spreading; inflorescence erect, ovary green 19. *A. ecklonis*
 - 25b Plants decumbent to pendent; leaves reflexed; inflorescence oblique, ovary yellow 11. *A. thompsoniae*

Almost all species in this group are characteristic of grassland. The grass aloes are less succulent than other groups in the genus, and generally flower in summer (the rainy season). Some occur in heavy, wet soils but most inhabit thin, stony, well-drained soils. Species with bulbous underground organs, though separated into a group on their own by Reynolds (1966), are included here because of the similarity of their above-ground parts to those of other members of this group and because of the presence of intermediate species that link them to this group rather than to any other. Narrow-leaved species in this group are generally difficult to distinguish from the grasses among which they grow, except when flowering. All grass aloes are easily distinguished from other aloes.



FIGURE 1.—Section *Leptoaloe*. *Aloe albida*: habit, $\times 1$. Taken from Glen & Hardy (1990a).

1. *Aloe saundersiae* (Reynolds) Reynolds in Journal of South African Botany 13: 103 (1947a); Reynolds: 111 (1950); Jeppe: 128 (1969); Bornman & D.S.Hardy: 1 (1972); B.-E. van Wyk & G.F.Sm.: 288 (1996). Type: KwaZulu-Natal, Nkandhla forest, *Saunders in Reynolds 1799* (PRE!).

Leptaloe saundersiae Reynolds: 124 (1936a).

A. minima J.M.Wood: t. 338 (1906) non Baker. Type: KwaZulu-Natal, Nkandhla, *Wylie s.n.* (NH!).

Stemless grass aloe 50–75 mm tall, solitary or rarely in small groups; roots fusiform. *Leaves* 10–16 in a rosette, linear, 40–175 × 3 mm, bright green, slightly canaliculate, margins minutely dentate. *Inflorescence* a capitate raceme; peduncle 190–235 mm long; bracts ovate-acuminate, thin, scarious, 7 × 3–4 mm, ± 5-nerved. *Flowers* cream-coloured or pale pink, 9–12 mm long; pedicels 8–10 mm long; segments free. *Anthers* not exerted. *Ovary* ± 2 × 1 mm, brownish; stigma not exerted. *Fruit* and seeds not seen. *Flowering time* February to March.

Endemic to KwaZulu-Natal and well-attested from grassland on a single mountain-top in Zululand, with a few outlying specimens. Map 1.

Plants of this smallest member of the genus *Aloe* are about half the size of those of *A. albida* (no. 2) and sucker far less freely. The flowers of

A. saundersiae are even smaller than those of *A. albida* and are regular, not zygomorphic.

In cultivation, this species is more susceptible to the depredations of snails than any other. Lady Saunders, after whom this species is named, collected the type specimen in the 1930s.

Vouchers: *Codd 6980* (NH, PRE); *Hilliard 1198* (NU); *Hilliard & Burt 15485* (PRE); *Reynolds 3225* (PRE); *Wisura 1170* (NBG).

2. *Aloe albida* (Stapf) Reynolds in Journal of South African Botany 13: 101 (1947a); Reynolds: 111 (1950); Jeppe: 128 (1969); Bornman & D.S.Hardy: 3 (1972); Compton: 97 (1976); Glen & D.S.Hardy: t. 2010 (1990a); B.-E. van Wyk & G.F.Sm.: 250 (1996). Type: Mpumalanga, Barberton, *Sharp s.n.* (K, holo.!, PRE, photo.!).

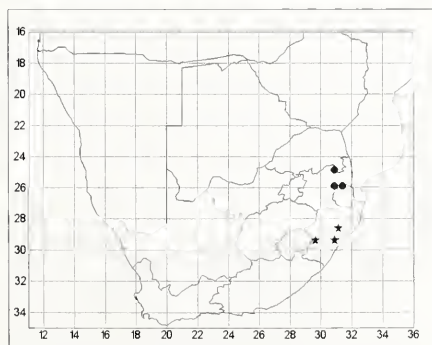
Leptaloe albida Stapf: t. 9300 (1933).

A. kraussii Baker var. *minor* Baker: 306 (1896a). *A. myriacantha* (Haw.) Roem. & Schult. var. *minor* (Baker) A.Berger: 167 (1908). Type: Mpumalanga, near Barberton, *Galpin 873* (K, holo.!, BOL!, GRA!, PRE!, PRE, photo.!).

A. kraussii Schönland: 34 (1903) non Baker. Type: Mpumalanga, Barberton, *Galpin 873* (GRA, holo.!, BOL!, K!, PRE!, PRE, photo.!).

Stemless grass aloe 75–100 mm tall, solitary or in small groups; roots fusiform. *Leaves* 6–12 in a rosette, linear, 50–180 × 1–5 mm, bright green, slightly canaliculate above, broadly deltoid in section, margins with minute white teeth. *Inflorescence* a capitate raceme; peduncle 100–350 mm long, with sterile bracts; bracts ovate-acuminate, ± 11 × 2–5 mm, 3–7-nerved. *Flowers* whitish, 13–18 mm long; pedicels ± 10 mm long; outer segments free, inner segments not adnate to the outer, mouth distinctly bilabiate, upturned. *Anthers* not or very shortly exerted. *Ovary* ± 3.0 × 1.5 mm, olive-green; stigma not or very shortly exerted. *Fruit* ± 8 × 4 mm, buff. *Flowering time* February to March. Figure 1.

Occurs in Mpumalanga and Swaziland. *Aloe albida* is one of the few heat-sensitive species of *Aloe*. Although it can be cultivated away



MAP 1.—★ *Aloe saundersiae*
● *A. albida*

from this area in a cool, shady place, it does not survive in cultivation even at the foot of its native mountains. Like *A. saundersiae* (no. 1), this species is readily eaten by snails, but often grows vigorously enough in cultivation to make good the damage. Map 1.

This species is most similar to *A. saundersiae* and *A. inconspicua* (no. 7). Differences between *A. albida* and *A. saundersiae* are discussed above. In *A. inconspicua* the flowers are green, not white, the leaves are slightly wider than in *A. albida* and there is a bulb-like swelling at the base of the plant, which is not the case in *A. albida*. Plants of *A. inconspicua* rarely if ever sucker, while plants of *A. albida* do so readily, and may form large many-headed clumps. In nature they appear to sucker less freely, and solitary plants are often found.

The specific epithet *albida* is the Latin for 'whitish' and refers to the unusual dirty-white flowers.

Vouchers: *Codd* 7825 (PRE); *Collins* TRV9897 (PRE); *Galpin* 873 (BOL, GRA, K, PRE); *Reynolds* 4966 (PRE); *Thorncroft* 73 (BM, K, PRE).

3. **Aloe myriacantha** (Haw.) Roem. & Schult., *Systema vegetabilium* 7: 704 (1829); Kunth: 516 (1843); Baker: 156 (1880a); Baker: 306 (1896a); A.Berger: 166 (1908); Reynolds: 100 (1947a); Reynolds: 116 (1950); Jeppe: 129 (1969); Bornman & D.S.Hardy: 7 (1972); West: 33 (1974); B.-E. van Wyk & G.F.Sm.: 282 (1996). Iconotype: unpublished plate at Kew, from plant collected by Bowie and described by Haworth.

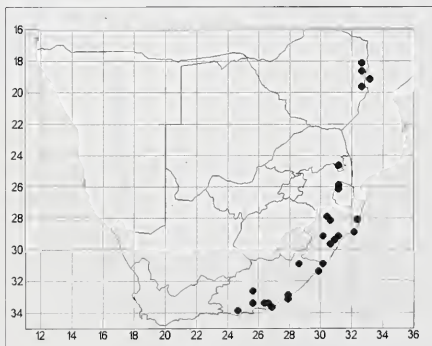
Bowiea myriacantha Haw.: 122 (1827). *Leptaloe myriacantha* (Haw.) Stapf: t. 9300 (1933).

Stemless grass aloe 200–300 mm tall, solitary; roots fusiform. *Leaves* 8–12 in a rosette, linear, 220–300 × 5–10 mm, bright green, slightly canaliculate, margins with minute white teeth. *Inflorescence* a capitate raceme; peduncle 200–500 mm long, with sterile bracts; bracts

ovate-acuminate, 10–20 × 4–5 mm, 5–many-nerved. *Flowers* reddish pink or rarely whitish, 12–25 mm long; pedicels 10–19 mm long; outer segments free, mouth upturned, bilabiate. *Anthers* not or very shortly exserted. *Ovary* ± 4 × 2 mm, tapering into style; stigma not or very shortly exserted. *Fruit* and seed not seen. *Flowering time* (in southern Africa) January to May.

Found in the Northern Province, Mpumalanga, Swaziland, KwaZulu-Natal and the Eastern Cape; also in Uganda, Kenya, Rwanda, Tanzania, Malawi and Zimbabwe. *A. myriacantha* characteristically grows among rocks in short, high-altitude grassland. At the southern end of its distribution range these conditions occur at lower altitude than to the north, and so, for example in the Mkambati Nature Reserve, this species is found less than a kilometre from the sea, at an altitude of less than 100 m. After *A. buettneri* (no. 8), *A. myriacantha* is the most widespread of all aloes, with a north-to-south range of over 5 000 km. Map 2.

The southern African aloe most similar to *A. myriacantha* is *A. albida* (no. 2). *A. myriacantha* is usually a much larger plant than *A. albida*, although small plants are found in 'hostile' habitats, such as thin soil on the edge of rock outcrops. The flowers of *A. myriacantha* are usually pink, although they may occasionally be very pale and appear almost white. The grey-white flowers with greenish tips characteristic



MAP 2.—*Aloe myriacantha*

of *A. albida* are not found in this species. Plants of *A. myriacantha* very rarely form clumps, unlike those of *A. albida*.

The specific epithet is derived from two Greek words meaning '10 000 thorns'. The leaf margins have many fine teeth.

Vouchers: *Galpin 7814* (PRE); *Glass Herb. Austro-Afr. 1554* (K, SAM, UPS); *Jacobsen 3324* (PRE); *Reynolds 1181* (BOL, PRE); *Smook 29* (MO).

4. *Aloe minima* Baker in Hooker's *icones plantarum* 25: t. 2423 (1895); Baker: 305 (1896a); A. Berger: 166 (1908); Reynolds: 101 (1947a); Reynolds: 118 (1950); Jeppe: 127 (1969); Bornman & D.S. Hardy: 9 (1972); Compton: 101 (1976); B.-E. van Wyk & G.F. Sm.: 278 (1996). Type: KwaZulu-Natal, South Downs, *M.S. Evans 409* (K, holo.; NH!; PRE, photo!).

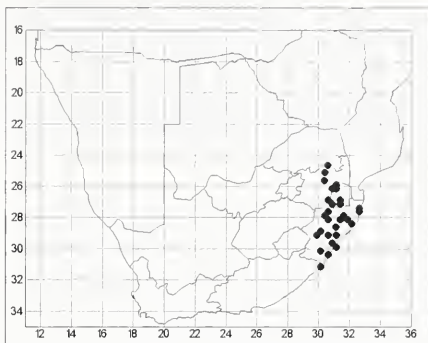
A. parviflora Baker: 785 (1901a); A. Berger: 165 (1908); Reynolds: 101 (1947a); Reynolds: 113 (1950); Jeppe: 126 (1969); Bornman & D.S. Hardy: 5 (1972). *Leptaloe parviflora* (Baker) Stapf: t. 9300 (1933). Type: KwaZulu-Natal, Pinetown, *Junod 146* (Z, holo.; PRE, photo!).

L. minima (Baker) Stapf: t. 9300 (1933).

L. blyderivierensis Groenew.: t. 651 (1938a). *A. minima* Baker var. *blyderivierensis* (Groenew.) Reynolds: 101 (1947a); Reynolds: 120 (1950). Type: Mpumalanga, north of Pilgrims Rest, *Van der Merwe 38* (PRE!).

Stemless grass aloe 200–300 mm tall, solitary; roots fusiform. *Leaves* 6–10 in a rosette, linear to lorate, 220–340 × 4–6 mm, bright green, slightly canaliculate, margins minutely denticulate. *Inflorescence* a capitate raceme; peduncle 220–480 mm long; bracts ovate-acuminate, ± 12 × 5 mm, ± 5-nerved. *Flowers* dull pink or greyish, 7–15 mm long; pedicels 10–20 mm long, lengthening in fruit; inner and outer segments free. *Anthers* not or very shortly exerted. *Ovary* ± 4.0 × 1.5 mm; style not or very shortly exerted. *Fruit* 10–15 × 5–7 mm, buff to pale grey. *Flowering time* 146 February to March.

Found in Mpumalanga, Swaziland, KwaZulu-Natal and the Eastern Cape. *Aloe minima* grows



MAP 3.—*Aloe minima*

in grassland on fairly heavy soils with loose stones. In this habitat it is unlike many of the members of this section, which grow wedged between large rocks. Map 3.

The differences between this species and *A. saundersiae* (no. 1) are analogous to those between *A. myriacantha* (no. 3) and *A. albida* (no. 2). *A. minima* is a much larger plant than *A. saundersiae*, and has larger pink flowers. Plants are solitary, and no instances of clumping have been recorded in this species. This species is much more widespread than *A. saundersiae*.

When it was described, this was the smallest *Aloe* known; *minima* in Latin means 'smallest'. The Zulu names for this species are *isipukutwane*, *isipukushane* and *isiputuma* (Reynolds 1950). The Zulu eat the young inflorescences of this species raw, as a vegetable.

Vouchers: *Acocks 13291* (PRE); *Codd 6401* (PRE); *Dyer 5321* (BOL, NH, PRE); *Reynolds 3457* (PRE); *Strey 6425* (NH, PRE).

5. *Aloe kniphofioides* Baker in Hooker's *icones plantarum* 20: t. 1939 (1890); Baker: 305 (1896a); A. Berger: 170 (1908); Reynolds: 9 (1948a); R.A. Dyer: t. 1120 (1950); Reynolds: 122 (1950); Jeppe: 118 (1969); Bornman & D.S. Hardy: 11 (1972); Compton: 100 (1976); B.-E. van Wyk & G.F. Sm.: 270 (1996). Type:

Eastern Cape, Mt Enkansweni, *Tyson* 2829 (K, holo.!: BOL!, GRA!, PRE!, SAM!: PRE, photo.!).

A. marshalli J.M.Wood & M.S.Evans: 353 (1897); A.Berger: 171 (1908). Type: KwaZulu-Natal, near Glencoe, *Medley Wood s.n.* (NH!).

Stemless grass aloe 350–400 mm tall, solitary; rootstock bulbous. *Leaves* ± 20 in a rosette, linear to narrowly lanceolate, 120–480 \times 5–8 mm, slightly canaliculate or shallowly D-shaped in section, margins entire or minutely dentate. *Inflorescence* a lax raceme; peduncle simple, 300–550 mm long, with sterile bracts; bracts ovate-acuminate, 15–22 \times 5–7 mm, 7–9-nerved. *Flowers* scarlet, 25–40(–50) mm long, cylindric; pedicels 12–18 mm long; outer segments connate for most of their length, inner segments adnate to outer, apices of all segments greenish. *Anthers* not or hardly exerted. *Ovary* 5–6 \times 2–3 mm; style not or hardly exerted. *Fruit* $\pm 22 \times 11$ mm. *Flowering time* November.

Found in Mpumalanga, Swaziland, KwaZulu-Natal, the eastern Free State and the Eastern Cape. *A. kniphofioides* is another grassland species in areas of reasonably high rainfall. It grows in rather heavy, stone-free soils. Map 4.

The lax inflorescence and distinct bulb of this species distinguish it from all other southern African aloes. Among southern African bulbous aloes, *A. modesta* (no. 6) has similar

leaves but a much denser raceme of small yellowish green (not red), scented flowers. *A. inconspicua* (no. 7) is smaller in all its parts and has a short, dense raceme of green odourless flowers, and *A. buettneri* (no. 8) is much larger in all its parts, with broad leaves and a branched panicle of yellow flowers with basal swellings.

This species is named for its resemblance to some species of *Kniphofia* (red-hot poker).

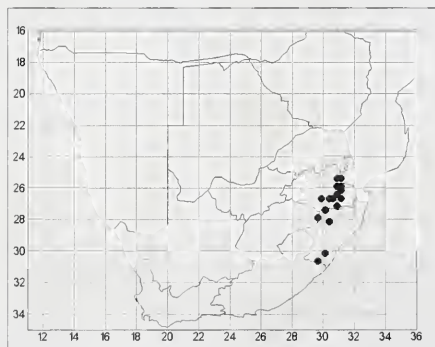
Vouchers: *Acocks* 15352 (PRE); *Brownlee* 235 (PRE); *Codd* 9392 (PRE); *Compton* 27216 (PRE); *Reynolds* 1124 (PRE).

6. *Aloe modesta* *Reynolds* in *Journal of South African Botany* 22: 85 (1956); *Jepp*: 132 (1969); *Bornman & D.S.Hardy*: 13 (1972); *D.S.Hardy*: 510 (1974); *B.-E. van Wyk & G.F.Sm.*: 280 (1996); *C.L.Craib & G.Condy*: 4, t. 2121 (1997). Type: Mpumalanga, near Dullstroom, *De Wet* in *Reynolds* 7626 (PRE!).

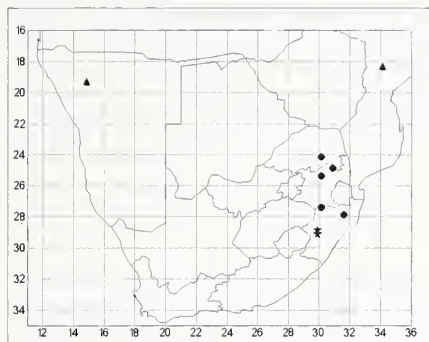
Stemless grass aloe 200–300 mm tall, solitary; rootstock bulbous. *Leaves* 4–8 in a rosette, lanceolate, 150–200 \times 6–9 mm, bright green, slightly canaliculate, margins entire, cartilaginous. *Inflorescence* a capitate raceme; peduncle 250–300 mm long, with sterile bracts; flower-bearing bracts lanceolate-acuminate, 10–13 \times 4–6 mm, 3–5-nerved; flowers upwardly spreading to horizontal, subsessile. *Flowers* yellowish green, scented, 10–15 mm long, cylindric to trigonous; pedicels ± 1 mm long; mouth upturned, outer segments free. *Anthers* exerted up to 3 mm. *Ovary* green, $\pm 4.0 \times 2.5$ mm; style exerted up to 5 mm. *Fruit* and seed not seen. *Flowering time* January to February.

Found in the Northern Province, Mpumalanga and KwaZulu-Natal. *A. modesta* grows in grassland in an area characterised by cold winters and high rainfall. The soils in which it occurs are reasonably heavy and sometimes shaly. Map 5.

This is the only species of *Aloe* in Africa which regularly has scented flowers. Differ-



MAP 4.—*Aloe kniphofioides*



MAP 5.—● *Aloe modesta*
★ *A. inconspicua*
▲ *A. buettneri*

ences between this species and *A. kniphofioides* (no. 5) are dealt with under that species. With its bulbous rootstock and capitate raceme of sessile flowers, *A. modesta* is so distinctive that it is not likely to be confused with any species other than *A. kniphofioides*.

The specific epithet, meaning 'sober', 'modest' or 'unassuming', refers to the inconspicuous appearance of this species.

Vouchers: *Devenish 1323* (NH, PRE); *Thorncroft 479* (NH).

7. *Aloe inconspicua* *Plowes* in *Aloe* 23: 32 (1986); B.-E. van Wyk & G.F.Sm.: 266 (1996). Type: KwaZulu-Natal, near Estcourt, *Plowes 7079* (PRE!).

Stemless grass aloe 150–300 mm tall, solitary, with leaf bases forming a bulbous swelling; roots fleshy. *Leaves* 6–12 in a rosette, 100–200 × 3–5 mm, dark green, canaliculate, lower surface with pale spots near base, margins cartilaginous, minutely dentate. *Inflorescence* a simple, very dense raceme; peduncle ± 150 mm tall, with few sterile bracts; bracts deltoid-cirrhus, 12–20 × 3–6 mm, 5-nerved. *Flowers* sessile, grass-green, unscented, 10–15 mm

long, throat slightly narrowed, mouth irregular; segments with white margins, free to base. *Anthers* exerted up to 1 mm. *Ovary* ± 3.0 × 1.5 mm, bright green; style not exerted. *Fruit* ochre-brown. *Seeds* tetrahedral, black. *Flowering time* November.

Endemic to thornveld in KwaZulu-Natal. Unlike other species of similar appearance, such as *A. albida* (no. 2), *A. inconspicua* inhabits an area of dry, low-altitude, thorny, open woodland which is hot in summer, but can become very cold in winter. The plants are extremely well-camouflaged at all phases of their life cycle by the green colour of both leaves and flowers, and the fact that they are rarely if ever as tall as the grasses on the woodland floor. *A. inconspicua* grows in a yellow, clayey soil which is almost as hard as concrete when dry. Map 5.

The form of the bulbous swelling at the leaf bases suggests that this plant is intermediate between *A. albida* (no. 2) and *A. myriacantha* (no. 3) on the one hand, and *A. kniphofioides* (no. 5) and *A. modesta* (no. 6), on the other. Differences between this species and *A. kniphofioides* and *A. modesta* are discussed under *A. kniphofioides*. Differences between *A. inconspicua* and the species most similar to it, *A. albida*, are discussed under that species.

The extremely apt specific epithet of this species refers to the great difficulty of finding these well-camouflaged plants in the veld.

Vouchers: *Glen 1607* (PRE); *Green s.n.* (NU); *West 1504* (NH).

8. *Aloe buettneri* *A. Berger* in *Botanische Jahrbücher* 36: 60 (1905a); *A. Berger*: 241 (1908); *Keay*: 67 (1963); *Reynolds*: 41 (1966); *Jankowitz*: 51 (1973); *D.S. Hardy*: 523 (1974); *Jankowitz*: 48 (1975). Type: Togo, near Bismarckburg, *Büttner 24* (B, holo.; PRE, photo!).

A. barteri *Baker*: 168 (1880a) pro parte; *Baker*: 464 (1898a) pro parte; *Hutch. & Dalziel*: 345 (1936) pro parte. Type: Guinea, Nupe, *Barter 1502* (K, holo.; PRE, photo!).

A. paedogona A.Berger: 57 (1906a); A.Berger: 240 (1908). Type: Angola, Malanga, Gossweiler 946 (BM).

A. bulbicaulis Christian: t. 630 (1936a); Reynolds: 12 (1954). Type: Zambia, Misundu, Christian PRE20587 (PRE!).

Stemless grass aloe 300–850 mm tall, usually solitary, rarely branching into two; rootstock bulbous. *Leaves* up to 16 in a rosette, deciduous, deltoid, 350–800 × 70–120 mm, distinctly V-shaped in section, leathery, apple-green, margins dentate. *Inflorescences* 2 or 3 consecutively, each 3–5(–12)-branched, 0.4–1 m long; racemes subcapitate to conical; peduncles with sterile bracts; floriferous bracts deltoid-acuminate, 7–15 × 5–8 mm, 5–7-nerved. *Flowers* greenish yellow to bright red, 28–45 mm long, obconic with a globose basal swelling; pedicels 15–25 mm long, elongating to 50 mm in fruit; outer segments free near apex, inner segments free but adnate to outer. *Anthems* exerted up to 2 mm. *Ovary* ± 7 × 8 mm; style exerted up to 4 mm. *Fruit* 35–45 × 15–25 mm, yellow-green-brown, with few transverse ribs. *Seeds* pale grey, winged, ± 12 × 6 × 4.5 mm. *Flowering time* (in southern Africa) October to March.

Found in northern Namibia; also throughout tropical Africa as far afield as Senegal, Togo and Malawi. In Namibia *A. buettneri* occurs in floodplains in an extremely flat area in mopane veld. In summer, the entire region is flooded for long periods. Map 5.

The bulbous basal swelling of the flower resembles that in section *Pictae*, but there is no other point of resemblance suggesting an affinity between this species and that section. Points of difference include the bulbous rootstock and broad, yellow-green, sharply channelled but not keeled, unspotted leaves. However, it is the most unusual member of this section. It would not readily be confused with any other aloe, on account of the combination of characters mentioned above.

In Mali, the bulb of this species yields an arrow poison and is used as a cicatrising agent for wounds (Watt & Breyer-Brandwijk 1963). Otto Büttner, after whom this species is named,

was a German botanist who flourished in the then German colonies of Kamerun (Cameroun) and Togo at the turn of the 19th to the 20th century. He was in charge of the agricultural research station at Bismarckburg in Togo.

Vouchers: *Fanshawe* 1780 (K); *Müller* 11802 (PRE); *Pawek* 4824 (K, MO); *Reynolds* 9328 (PRE); *Torre & Pereira* 12410 (LISC).

9. Aloe chortolirioides A.Berger in *Das Pflanzenreich* 33: 171 (1908); Pole Evans: t. 160 (1924a); Reynolds: 124 (1950); Jeppe: 116 (1969); Bornman & D.S.Hardy: 15 (1972); Compton: 98 (1976); B.-E. van Wyk & G.F.Sm.: 254 (1996). Type: Mpumalanga, Barberton, *Thorncroft s.n.* (BOL!).

A. boastii Letty: t. 553 (1934a); Reynolds: 102 (1938a). *A. chortolirioides* A.Berger var. *boastii* (Letty) Reynolds: 127 (1950); Compton: 98 (1976). Type: Swaziland, Forbes Reef, *H.W. Boast* PRE16563 (PRE!).

Much-branched short-stemmed grass aloe 200–300 mm tall, forming dense tufts; roots fusiform. *Leaves* 15–20 in a rosette, linear, 90–250 × 2–5 mm, canaliculate, dull green, margins dentate. *Inflorescence* a simple capitate raceme; peduncle 150–250 mm long, with sterile bracts; bracts deltoid-acuminate, 13–17 × 4–5 mm, 3–5-nerved. *Flowers* yellow to red, 20–35 mm long, cylindric; pedicels 10–25 mm long; segments free almost to base. *Anthems* exerted up to 2 mm. *Ovary* green, 5–6 × 2–3 mm; style exerted up to 5 mm. *Fruit* ± 14 × 7 mm.

Both varieties of *A. chortolirioides* usually occur wedged between rocks in grassland in the mist belt on the escarpment of the Northern Province, Mpumalanga and Swaziland.

Individual heads of a plant of this species may be confused with *A. kniphofioides* (no. 5). This species normally forms vast clumps with 50 or more heads of leaves, is short-stemmed and not bulb-forming, and has dense capitate racemes. Plants of *A. kniphofioides* are solitary, stemless and bulb-forming, with lax cylindric racemes. *A. dominella* (no. 10) is similar to this species, but has wider leaves and shorter flowers.

Two varieties are recognised:

Leaves up to 250×5 mm

. 9a. var. *chortolirioides*

Leaves up to 400×8 mm . . . 9b. var. *woolliana*

9a. var. *chortolirioides*.

Description as for species.

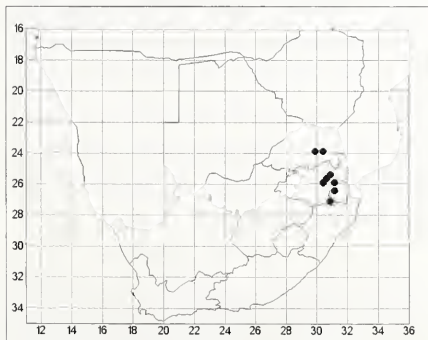
Found in the Northern Province, Mpumalanga and Swaziland. *A. chortolirioides* var. *chortolirioides* flowers only after burning, but var. *woolliana* will flower without the aid of fire. Because var. *chortolirioides* needs fire to flower, it is difficult to cite a flowering season, but it has been recorded as flowering from March to September. Map 6.

The specific epithet indicates a resemblance between this species and *Chortolirion angolense* (or *Haworthia angolensis*), a member of the Asphodelaceae.

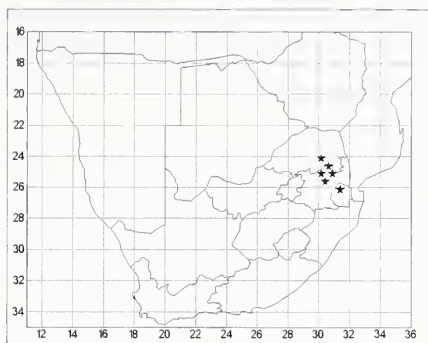
Vouchers: *Compton* 27804 (PRE); *Galpin* 490 (BOL, K, NBG, PRE, SRGH); *Onderstall* 899 (PRE); *Reynolds* 3308 (PRE); *Verdoorn* 2523 (PRE).

Hybrid:

A. chortolirioides var. *chortolirioides* \times *A. arborescens* (no. 96). Voucher: *Leach* 502 (SRGH).



MAP 6.—*Aloe chortolirioides* var. *chortolirioides*



MAP 7.—*Aloe chortolirioides* var. *woolliana*

9b. var. *woolliana* (*Pole Evans*) *Glen & D.S.Hardy* in *South African Journal of Botany* 53: 489 (1987a).

A. woolliana *Pole Evans*: t. 557 (1934a); *Reynolds*: 128 (1950); *Jepp*: 117 (1969); *Bornman & D.S.Hardy*: 17 (1972). Type: Mpumalanga, Kaapsehoop, *Pole Evans* PRE8320 (PRE!).

Plants slightly taller and more robust, up to 400 mm tall. *Leaves* linear-lorate, 250–400 \times 4–8 mm, faintly striate. *Bracts* 5–7-nerved. All other characters as for species.

Found in the Northern Province, Mpumalanga and Swaziland. Map 7.

The variety is more robust than the species, with larger leaves. It flowers in summer without fire stimulus.

Mr Woolley, after whom this variety is named, lived in Barberton in the 1930s and collected the first specimen of this plant, which was passed on to *Pole Evans* by *Thorncroft*.

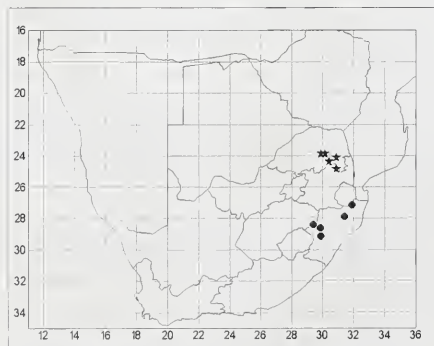
Vouchers: *Codd* 8060 (PRE); *Hardy* 4262 (PRE); *Kluge* 1376 (PRE); *Mogg* 13940 (PRE); *Reynolds* 3004 (PRE).

10. *Aloe dominella* *Reynolds* in *Journal of South African Botany* 4: 101 (1938a); *Reynolds*: 129 (1950); *Jepp*: 130 (1969); *Born-*

man & D.S.Hardy: 19 (1972); B.-E. van Wyk & G.F.Sm.: 258 (1996). Type: KwaZulu-Natal, between Estcourt and Mooi River, *Reynolds 2094* (PRE!).

Much-branched, short-stemmed grass aloe 300–400 mm tall, forming dense tufts; roots fusiform. *Leaves* ± 20 in a rosette, linear, 70–375 \times 2–10 mm, D-shaped in section, margins dentate. *Inflorescence* a simple capitate raceme; peduncle 250–350 mm long, with sterile bracts; bracts ovate-deltoid, $\pm 15 \times 3$ –4 mm, 3–5-nerved. *Flowers* lemon-yellow, 13–18 mm long; pedicels 13–20 mm long; all segments free to base. *Anthers* exerted 2–4 mm. *Ovary* 2–4 \times 1.5–2 mm, green; style exerted up to 7 mm. *Flowering time* June to September.

Occurring in Swaziland and KwaZulu-Natal. Like *A. chortolirioides* (no. 9), *A. dominella* occurs wedged between rocks in grassland. Flowering in this species does not seem to be as strongly linked to fire as in *A. chortolirioides*. Reynolds (1950) notes that in cultivation, flowering occurred in February (a very unusual time for field plants) in an unburnt plant and July to October (a month later than usual for field plants) in a plant that was deliberately burnt. Evidently, therefore, there is some link between fire and flowering in this species. Map 8.



MAP 8.—● *Aloe dominella*
★ *A. thompsoniae*

A note attached to *Acocks 10693* states that the flowers are sweet-scented. This seems to be the only record of this character in this species. The only taxon with which it is likely to be confused is *A. chortolirioides*. Differences between this species and the latter are discussed under that species.

The specific epithet seems to be a corruption of the Latin word *dominilla*, which signifies (roughly) 'the lady of the house'. The explanation of this unusual choice of name appears to be that the type specimen was collected on a farm belonging to a Miss Quedstedt.

Vouchers: *Acocks 10693* (NH, PRE); *De Wet PRE 37707* (BOL, NH, PRE); *Trauseld 1098* (NU); *Van der Merwe 2768* (PRE); *West 2125* (PRE).

11. *Aloe thompsoniae* Groenew. in Tydskrif vir Wetenskap en Kuns 14: 64 (1936a) sphalm. *thompsoni*; Reynolds: t. 980 (1945); Reynolds: 131 (1950); Jeppe: 119 (1969); Bornman & D.S.Hardy: 21 (1972); Glen & G.F.Sm.: 37 (1995); B.-E. van Wyk & G.F.Sm.: 292 (1996). Type: Northern Province, Haenertsburg, *Thompson PRE274* (PRE, lecto!).

Much-branched grass aloe 150–200 mm tall, suckering to form dense recumbent to pendent clumps; roots fusiform. *Leaves* 12–18 in a rosette, lorate, 90–200 \times 4–15 mm, often reflexed, canaliculate, apple-green, margins dentate. *Inflorescences* 1–3 from a rosette, simple, with subcapitate to conical racemes; peduncle 150–200 mm long, with sterile bracts; bracts deltoid-acute, 9–10 \times 3–6 mm, 5–8-nerved. *Flowers* orange, 22–28 mm long; all segments free; pedicels 9–24 mm long. *Anthers* not exerted. *Ovary* 4.0–5.0 \times 1.5–2.0 mm, lemon-yellow; style not exerted. *Flowering time* December to January.

Occurring in the Northern Province and Mpumalanga. This is one of the few species of *Aloe* that requires permanent high humidity. It is found on cliffs in the mist belt on this part of the eastern escarpment. Map 8.

In this species and *A. nubigena* (no. 13), both of which are often pendent on rocks, the peduncle is bent, often in a U-curve, so that the raceme is always vertical. *A. thompsoniae* differs from *A. nubigena* by being a smaller plant with stiffer leaves and bracts with distinct veins. In *A. thompsoniae* the leaves are rosulate, but in *A. nubigena* they are often distichous. This species has rosulate leaves and bracts with distinct veins, and grows in clumps, whereas *A. soutpansbergensis* (no. 12) has fewer leaves, which are distichous when young, and bracts with obscure veins, and is often solitary.

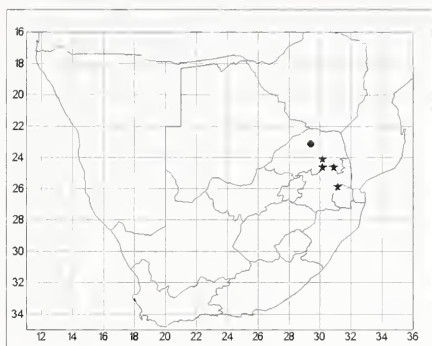
Aloe thompsoniae is named after its discoverer, Mrs Thompson of Haenertsberg.

Vouchers: *Leach* 24 (SRGH); *Mogg* 13939 (PRE, SRGH); *Van der Merwe* 26 (PRE); *Van Jaarsveld* 426 (PRE); *Venter* 1271 (PRE).

12. *Aloe soutpansbergensis* I. Verl. In The Flowering Plants of Africa 35: t. 1391 (1962); Jeppe: 120 (1969); Bornman & D.S. Hardy: 27 (1972); D.S. Hardy: 515 (1974); Glen & D.S. Hardy: 151 (1991); B.-E. van Wyk & G.F. Sm.: 290 (1996). Type: Northern Province, Soutpansberg, *Crundall* PRE29005 (PRE!).

Short-stemmed grass aloe 200–300 mm tall, solitary or suckering; prostrate to pendent. *Leaves* ± 7 , distichous at first, becoming rosulate, lorate, 110–300 \times 6–12 mm, canaliculate, margins minutely denticulate below middle. *Inflorescence* a subcapitate raceme; peduncle 160–240 mm long, with few sterile bracts; bracts ovate-acute, 10–17 \times 5–6 mm, veins obscure. *Flowers* orange, 19–27 mm long, cylindric; pedicels 11–25 mm long; segments free to base. *Anthems* included. *Ovary* 3.5–7.0 \times 1.5–2.0 mm, yellowish green; style included. *Fruit* $\pm 25 \times 9$ mm, buff to grey. *Seeds* charcoal-grey, $\pm 4 \times 2 \times 1$ mm, not winged. *Flowering time* January to February.

Endemic to the Northern Province. *A. soutpansbergensis* occurs wedged between rocks in the mist belt in the highest areas of the Soutpansberg. Map 9.



MAP 9.—● *Aloe soutpansbergensis*
★ *A. nubigena*

Differences between this species and *A. thompsoniae* (no. 11) are dealt with under that species. Rosettes of *A. soutpansbergensis* are more often solitary than those of *A. nubigena* (no. 13), and contain fewer, narrower leaves.

The name of this species is derived from its habitat, in the Soutpansberg.

Vouchers: *Galpin* 14006 (PRE); *Hardy* 900 (PRE); *Lavranos* 1017 (PRE); *Meeuse* 10345 (PRE); *Thompson* PRE 37733 (PRE).

13. *Aloe nubigena* Groenew. in Tydskrif vir Wetenskap en Kuns 14: 136 (1936b); Pole Evans: t. 628 (1936a); Reynolds: 132 (1950); Jeppe: 120 (1969); Bornman & D.S. Hardy: 23 (1972); B.-E. van Wyk & G.F. Sm.: 284 (1996). Type: Mpumalanga, Graskop, *F.Z. van der Merwe* 133 (PRE!).

Plants suckering, forming dense clumps 150–300 mm tall; short-stemmed, pendent. *Leaves* ± 16 , distichous or rosulate, horizontal to reflexed, lorate-lanceolate, 160–330 \times 12–20 mm, slightly canaliculate, apple-green, margins entire, ciliate or obscurely denticulate. *Inflorescence* a capitate raceme; peduncle 150–300 mm long, with sterile bracts; bracts ovate-acute, 10–14 \times 3–8 mm, obscurely many-nerved. *Flowers* orange, 17–27 mm long, cylindric; all

segments free, often with green apices; pedicels 14–26 mm long. *Anthems* exserted up to 1 mm. *Ovary* pale yellow, 4.5–6.0 × 2.0 mm; style exserted up to 1 mm. *Fruit* ± 19 × 9 mm. *Flowering time* December to February.

Occurring in the Northern Province and Mpumalanga. *Aloe nubigena* is another cliff-dweller of the eastern escarpment, and is found in the mist belt, usually facing seawards. Map 9.

Differences between this species and its closest allies, *A. thompsoniae* (no. 11) and *A. soutpansbergensis* (no. 12), are discussed under those species. In addition, the leaves of *A. thompsoniae* are armed with distinct, if small, teeth, whereas those of *A. nubigena* have subentire margins.

The specific epithet, meaning 'cloud-born', very aptly signifies the habitat of this aloe.

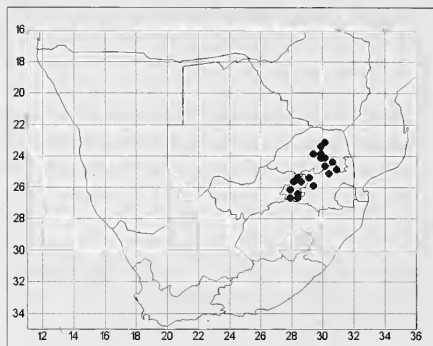
Vouchers: *Bos 1018* (K, PRE, STE, WAG); *Codd 9793* (PRE); *Nel 217* (NBG, PRE); *Reynolds 1790* (PRE); *Schmitz 4503* (PRE).

Hybrid:

A. nubigena × *A. arborescens* (no. 96).
Voucher: *Brent NBG550/56* (NBG).

14. *Aloe verecunda* *Pole Evans* in Transactions of the Royal Society of South Africa 5: 703 (1917); *Pole Evans*: t. 124 (1924b); *Reynolds*: 134 (1950); *Jeppé*: 123 (1969); *Bornman & D.S.Hardy*: 25 (1972); *B.-E. van Wyk & G.F.Sm.*: 294 (1996). Type: Northern Province, Wolkberg, *P.J. Pienaar s.n.* (PRE!).

Apparently stemless grass aloe, 300–450 mm tall, in tufts, rarely solitary. *Leaves* 8–10, usually distichous, rarely subrosulate, loriate, 160–400 × 7–15 mm, canaliculate, dark green, margins dentate. *Inflorescence* a capitate raceme; peduncle 250–400 mm long, with sterile bracts; bracts ovate-acute, 16–21 × 4–10 mm, venation obscure. *Flowers* scarlet to magenta, 20–30 mm long; outer segments free;



MAP 10.—*Aloe verecunda*

pedicels 20–30 mm long. *Anthems* exserted up to 3 mm. *Ovary* ± 7.0 × 2.5 mm; style exserted up to 10 mm. *Fruit* grey-buff, 20–25 × 8–10 mm. *Seeds* charcoal-grey, ± 4 × 2 × 2 mm, with membranous wings. *Flowering time* December.

Occurring in the Northern Province, Gauteng and Mpumalanga. *A. verecunda* normally grows wedged between boulders on ridges of the highveld, in grassland. These places are colder than the surrounding area, but do not seem to receive much more rain. Map 10.

Large plants of this species approach *A. cooperi* (no. 21) in appearance, but lack the keeled leaves characteristic of that species. In *A. verecunda* there are fewer leaves per head than in *A. cooperi*, and the inflorescences are smaller in all their parts. Differences between this species and *A. vossii* (no. 16) are dealt with under that species.

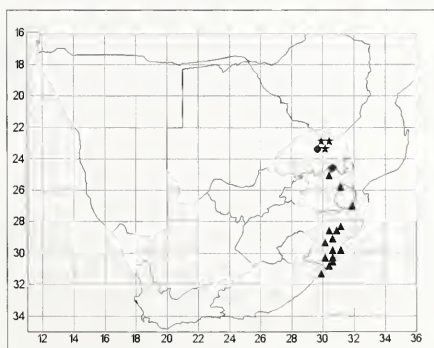
The specific epithet of this species means 'modest' or 'shy'. In winter the leaves wither completely, and the plant is then almost impossible to see.

Vouchers: *Codd 9882* (PRE, UPS); *Galpin 1455* (BOL, PRE); *Hardy 3950* (PRE); *Plowes 2217* (PRE, SRGH); *Reynolds 5708* (PRE, SRGH).

15. *Aloe fouriei* D.S.Hardy & Glen in The Flowering Plants of Africa 49: t. 1941 (1987); B.-E. van Wyk & G.F.Sm.: 262 (1996). Type: Mpumalanga, Pilgrims Rest District, *Fourie 3070* (PRE!).

Short-stemmed grass aloe, solitary or forming small clumps; stems ± 150 mm tall, with old leaf bases adhering in apical ± 100 mm. *Leaves* distichous, $275\text{--}350 \times 10\text{--}25$ mm, canaliculate, not keeled, grass-green, margins armed with teeth ± 0.4 mm long, 0.6 mm wide and 2.5 mm apart; old leaves dying back with persistent dead apices, and with white spots on abaxial surfaces. *Inflorescence* a subdense, capitate raceme of ± 20 flowers; peduncle ± 400 mm long, with ovate-acute sterile bracts; floriferous bracts with many nerves, $\pm 16 \times 8$ mm. *Flowers* $35\text{--}40$ mm long, $11\text{--}13$ mm in diameter at base, $6\text{--}8$ mm at mouth; all segments free to base, outer segments orange with green apices, inner segments yellow with green apices; pedicels pale green, $23\text{--}45$ mm long, lengthening in fruit. *Anthers* included. *Style* included.

Occurring in montane grassland of the Northern Province and Mpumalanga. *Aloe fouriei* favours steep slopes of southeastern aspect in grassland in dolomitic crevices. In such places, it may grow with stems erect to oblique. Map 11.



MAP 11.—● *Aloe fouriei*
★ *A. vossii*
▲ *A. linearifolia*

The only other southern African species with any marked similarity to *A. fouriei* is *A. cooperi* (no. 21), a stemless species in which the leaves are keeled, the bracts are smaller than in our species and the pedicels are the same colour as the flower, not pale green like the upper peduncle as in our species. The caulescent habit and subcapitate racemes of this species serve to distinguish it from other members of section *Leptoaloe*. The perianth segments are thick and fleshy, and so the sutures between the outer segments appear as channels in the unopened buds as well as in the mature flowers. The flower is distinctly trigonous, a character unusual in this section.

Voucher: *Fourie 3070* (PRE); *Plowes 2217* (PRE) possibly belongs here.

16. *Aloe vossii* Reynolds in Journal of South African Botany 2: 65 (1936b); Reynolds: 136 (1950); Jeppe: 123 (1969); Bornman & D.S.Hardy: 29 (1972); B.-E. van Wyk & G.F.Sm.: 296 (1996). Type: Northern Province, Soutpansberg, *Voss in Reynolds 557* (PRE, holo.; BOL!).

Apparently stemless grass aloe $400\text{--}500$ mm tall, solitary. *Leaves* $14\text{--}20$ in a rosette, lorate, $250\text{--}500 \times 7\text{--}25$ mm, narrowed towards apex, margins dentate. *Inflorescence* a capitate raceme; peduncle $275\text{--}500$ mm long, with sterile bracts; bracts ovate-acute, $\pm 16 \times 7\text{--}11$ mm, ± 7 -nerved. *Flowers* orange to scarlet, $20\text{--}30$ mm long; all segments free; pedicels $17\text{--}30$ mm long. *Anthers* not or very shortly exerted. *Ovary* $\pm 6.0\text{--}7.0 \times 2.5$ mm, green; style not or very shortly exerted. *Fruit* dark grey-brown, $\pm 28 \times 12$ mm. *Flowering time* January to February.

Endemic to the Northern Province. *A. vossii* grows in dense grassveld rich in forbs, in rocky places. It requires a somewhat warmer climate than *A. verecunda* (no. 14). Map 11.

The leaves of this species are longer and more copiously spotted than those of *A. verecunda*, and are rosulate. In addition, there are

minor differences in the form of the leaf spots and of the flowers.

Mr Harold Voss, after whom this species is named, made the first collection of it.

Vouchers: *Hardy 377* (PRE); *Hemm 400* (J, PRE, VENDA); *Leach 8465* (SRGH); *Obermeyer 1203* (PRE); *Van der Merwe 299* (PRE).

17. *Aloe linearifolia* A.Berger in Botanische Jahrbücher 57: 640 (1922); Reynolds: 169 (1941); Reynolds: t. 849 (1942); Reynolds: 139 (1950); Jeppe: 130 (1969); Bornman & D.S.Hardy: 33 (1972); B.-E. van Wyk & G.F.Sm.: 274 (1996). Type: KwaZulu-Natal, Dumisa, *Rudatis 1643* (B).

Stemless grass aloe 200–300 mm tall, solitary; main stem sometimes once- or twice-branched. *Leaves* 6–8, usually distichous, rarely spirally twisted, lorate, 160–360(–600) × 4–8(–10) mm, margins entire or minutely denticulate. *Inflorescence* a dense capitate raceme; peduncle 160–350(–600) mm long, with many sterile bracts; bracts ovate-acuminate, 10–15 × 4–7 mm, 5–7-nerved. *Flowers* greenish yellow to yellow, 11–15 mm long, mouth upturned; all segments free; pedicels 12–20 mm long. *Anthers* not or shortly exserted. *Ovary* 3.5–4.0 × 1.5–2.0 mm, green; style exserted to 2 mm. *Fruit* ± 18 × 9 mm, buff. *Flowering time* January to February.

Found in Mpumalanga, Swaziland, KwaZulu-Natal and the Eastern Cape. Plants of this species may be commoner than they seem. As they are slightly smaller than the grasses among which they grow and the flowers are an inconspicuous shade of yellow, they are very difficult to see in nature. Map 11.

The racemes of this species are similar to those of *A. myriacantha* (no. 3) and *A. minima* (no. 4), while the flowers are similar in shape, structure and colour to those of *A. ecklonis* (no. 19). However, the flowers in this species are much smaller than those of *A. ecklonis*. The

leaves of this species are more conspicuously very narrowly rectangular (linear) than most.

Vouchers: *Codd 9525* (PRE); *Gerstner 624* (PRE); *Medley Wood 9254* (PRE); *Obermeyer 208* (PRE); *Reynolds 3980* (PRE).

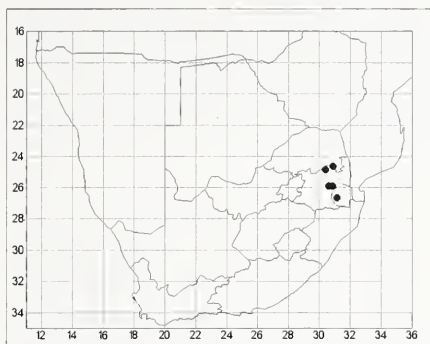
18. *Aloe integra* Reynolds in The Flowering Plants of South Africa 16: t. 607 (1936c); Reynolds: 141 (1950); Jeppe: 131 (1969); Bornman & D.S.Hardy: 35 (1972); Compton: 100 (1976); B.-E. van Wyk & G.F.Sm.: 268 (1996). Type: Mpumalanga, Lydenburg District, *Reynolds 1650* (PRE, holo.; BOL!).

Stemless grass aloe 350–500 mm tall, solitary; roots fusiform. *Leaves* 15–30 in a rosette, lorate, 100–200(–500) × 20–50 mm, often with a short or long dried apex adhering, slightly canaliculate, margins cartilaginous, usually entire, rarely ciliate. *Inflorescence* a dense, cylindric-conical to capitate raceme; peduncle 350–700 mm long (including raceme), with sterile bracts; bracts narrowly deltoid-acuminate, 12–25 × 4–6 mm, 5–7-nerved, purplish. *Flowers* lemon-yellow to canary-yellow, 13–27 mm long; segments free; pedicels 20–30 mm long, lengthening in fruit to 30–40 mm. *Anthers* exserted 1–3 mm. *Ovary* 5–7 × 2–3 mm, olive-green; style exserted 2–5 mm. *Fruit* 12–15 × 6–8 mm, pale grey. *Flowering time* October to December.

Found in Mpumalanga and Swaziland. *A. integra* occurs in highveld grassland, usually on sandy, stony soil. Flowering seems to be stimulated by fire. Map 12.

The racemes of this species terminate in a small tuft of purple bracts, unlike any other species in this section. In general appearance this species is closest to *A. ecklonis* (no. 19), and when not in flower it may be distinguished from that species by the shorter leaves, of which the margins are entire or at most only minutely denticulate.

The entire (without teeth) leaf margins of this species are highlighted by the specific

MAP 12.—*Aloe integra*

epithet (*integra* meaning 'entire, complete, whole').

Vouchers: *Reynolds 1636* (PRE); *Van der Merwe 45* (PRE).

19. *Aloe ecklonis* *Salm-Dyck*, *Monographia generum Aloes et Mesembryanthemi*: 21, t. 2 (1849); Baker: 158 (1880a); Baker: 309 (1896a); A.Berger: 168 (1908); Pole Evans: t. 609 (1936b); Reynolds: 145 (1950); Jeppe: 121 (1969); Jacot Guillarmod: 140 (1971); Bornman & D.S.Hardy: 39 (1972); B.-E. van Wyk & G.F.Sm.: 260 (1996). Iconotype: *Salm-Dyck*, *Monographia generum Aloes et Mesembryanthemi*: 21, t. 2 (1849).

A. kraussii Baker: 159 (1880a); Baker: 306 (1896a); J.M.Wood: t. 292 (1902); A.Berger: 169 (1908); Pole Evans: t. 635 (1936c); Reynolds: 143 (1950); Jeppe: 121 (1969); Bornman & D.S.Hardy: 37 (1972); B.-E. van Wyk & G.F.Sm.: 272 (1996), non Schönland. Type: KwaZulu-Natal, Bay of Natal, *Krauss 275* (BM).

A. boylei Baker: 84 (1892a); Baker: 307 (1896a); A.Berger: 170 (1908); Pole Evans: t. 634 (1936d); Reynolds: 153 (1950); Jeppe: 122 (1969); Bornman & D.S.Hardy: 45 (1972); Compton: 98 (1976); B.-E. van Wyk & G.F.Sm.: 252 (1996). Type: KwaZulu-Natal, Tugela Valley, *Allison sub Boyle s.n.* (K, holo.; PRE, photo.).

A. agrophila Reynolds: 70 (1936b). Type: Eastern Cape, Mlengana, *Reynolds 1749* (PRE!).

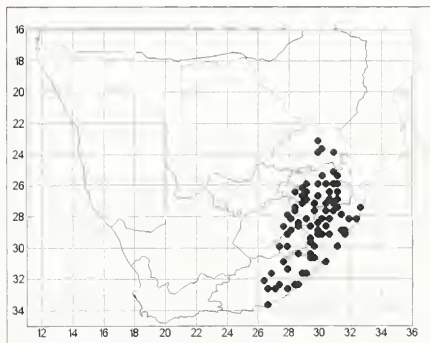
A. hlangapies Groenew.: 60 (1936c); Pole Evans: t. 710 (1938a); Reynolds: 137 (1950); Jeppe: 124 (1969); Born-

man & D.S.Hardy: 31 (1972); Compton: 99 (1976); Glen, G.F.Sm. & D.S.Hardy: 98 (1995); B.-E. van Wyk & G.F.Sm.: 264 (1996). Lectotype: Mpumalanga, Piet Retief District, *Van der Merwe 102* (PRE!).

A. boylei Baker subsp. *major* Hilliard & B.L.Burt: 252 (1985). Type: KwaZulu-Natal, Ngome, *Hilliard & Burt 8438* (E, holo.; NU!; PRE, photo.).

Erect, stemless or short-stemmed grass aloe 0.5–1 m tall, solitary or in groups; roots fusiform. *Leaves* 8–20, distichous or in a rosette, lorate to ensiform, 200–400 × 15–90 mm, canaliculate, blue-green to emerald-green, margins cartilaginous, armed with firm minute white cartilaginous teeth. *Inflorescence* a capitate raceme; peduncle 300–560 mm long, with sterile bracts; bracts narrowly deltoid-acuminate, 10–20 × 3–5 mm, 3–5-nerved. *Flowers* lemon-yellow to red, ± 14–24 × 7 mm, mouth sometimes upturned; all segments free; pedicels 16–40 mm long, lengthening in fruit. *Anthers* exserted 1–3 mm. *Ovary* 4–9 × 2–3 mm, green; style exserted 2–5 mm. *Fruit* 18–35 × 6–13 mm, brown or grey. *Flowering time* November to February.

Found in the Northern Province, Mpumalanga, Swaziland, the Free State, KwaZulu-Natal, Lesotho and the Eastern Cape. *A. ecklonis* usually occurs on very heavy soils which pack hard on drying. The surrounding vegetation is usually grassland, which may be dense or sparse, dry or wet, at low or high altitude. Map 13.

MAP 13.—*Aloe ecklonis*

This is the most variable and, after *A. myriacantha* (no. 3) and *A. buettneri* (no. 8), the most widely distributed species in the section. Leaves may be broad or narrow, rosulate or distichous, glaucous blue-green or grass-green, with or without spots at the base, and with large or small marginal teeth. Flowers may be yellow, pink or any shade between. All the extremes, which have been described at specific or infraspecific rank, are connected by intermediates, and by modifying cultural conditions it is possible to transform plants of one form into another. Despite this great variability, *A. ecklonis* resembles only one species, namely *A. integra* (no. 18), at all closely. *A. integra* has shiny leaves with distinct lines, and the remains of leaves that have died back are purple. *A. ecklonis* has duller leaves without lines, which die back pale brown to grey. Other characters separating these two species are discussed under *A. integra*.

The epithet of one of the synonyms, *A. hlangapies*, was changed illegitimately first to *A. hlangapitis* (Groenewald 1936d) and then to *A. hlangapensis* (Groenewald 1937a). Common names recorded for this species include *lekhalana*, *hloho tsa makaka* and *maroba-lihale* (seSotho), and *isipukutwane* (Zulu) (Reynolds 1950). The specific epithet commemorates the collector of the type specimen, C.F. Ecklon. Ecklon was one of the first major collectors to travel extensively in southern Africa, which he did between 1823 and 1827, and again between 1829 and 1833. Gunn & Codd (1981) give fuller biographical details of Ecklon. This species is used in initiation and fertility rites in Lesotho. The Zulu eat the inflorescence as a vegetable, while the South Sotho use the plant (particularly the leaves?) as a purgative and as a charm 'to turn enemy bullets to water'.

Vouchers: *Acocks* 18395 (PRE); *Galpin* 1254 (BOL, K, PRE); *Jacot Guillarmod* 5345 (PRE); *Prosser* 1996 (PRE); *Strey* 6345 (NH, PRE).

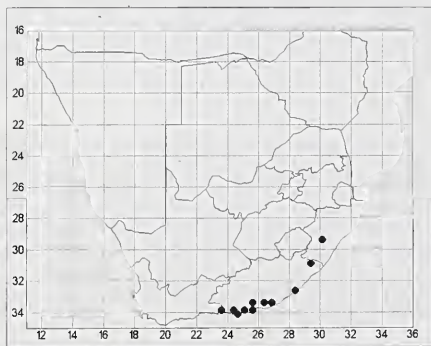
20. *Aloe micracantha* Haw., *Supplementum plantarum succulentarum* 105 (1819); Sims: t. 2272 (1821); Link & Otto: t. 40 (1825); Salm-Dyck: 21, t. 1 (1840); Baker: 159 (1880a);

Baker: 306 (1896a); A.Berger: 169 (1908); Reynolds: 147 (1950); Jeppe: 126 (1969); Bornman & D.S.Hardy: 41 (1972); G.F.Sm.: 55 (1993); Glen & G.F.Sm.: 37 (1995); B.-E. van Wyk & G.F.Sm.: 276 (1996). Neotype: *Burchell* 4482 (K!).

Stemless grass aloe 350–500 mm tall, solitary; roots fusiform. *Leaves* 12–18 in a rosette, lorate, 300–500 × 20–40 mm, acuminate, with irregular white spots on both surfaces throughout or only near expanded bases, margins cartilaginous, dentate. *Inflorescence* a capitate raceme; peduncle 250–500 mm long, with sterile bracts; bracts ovate-acuminate, 22–27 × 5–7 mm, many-nerved. *Flowers* salmon-pink, 26–38 mm long; all segments free; pedicels 20–35 mm long, lengthening to ± 50 mm in fruit. *Anthers* not or hardly exerted. *Ovary* ± 8 × 3 mm, salmon-pink; style exerted 1–2 mm. *Fruit* ± 28 × 12 mm, grey. *Seeds* black, in a semitransparent white membranous sac forming wings, ± 6.0–7.0 × 4.0 × 1.5 mm including wing. *Flowering time* December to January.

Found in KwaZulu-Natal and the Eastern Cape. This species occurs in well-drained, dry, sandy or stony places, often wedged between rocks. It is very difficult to maintain in cultivation. Map 14.

Characters that distinguish this species from all others in the section include the copious



MAP 14.—*Aloe micracantha*

spots on both sides of the leaves, extending almost to the leaf tips; the flowers, pedicels and bracts which are all the same colour; and the distribution range, which is the southwestern-most in the group. The plant figured under this name in *The Flowering Plants of South Africa* 3: t. 111 (1923) is not this species but rather *A. ecklonis* (no. 19).

The specific epithet refers to the remarkably small teeth on the leaves of this species.

Vouchers: *L.L. Britten 1248* (GRA, PRE); *I.L. Drège 67* (PRE); *Fourcade 2440* (BOL, PRE); *Long 279* (PRE); *Reynolds 1757* (BOL, PRE).

21. *Aloe cooperi* Baker in *The Gardeners' Chronicle* 1: 628 (1874); Baker: t. 6377 (1878a); Baker: 305 (1896a); J.M.Wood & M.S.Evans: t. 41 (1899); A.Berger: 167 (1908); Pole Evans: t. 578 (1935a); Reynolds: 150 (1950); Jeppe: 125 (1969); Bornman & D.S.Hardy: 43 (1972); Compton: 99 (1976); B.-E. van Wyk & G.F.Sm.: 256 (1996). Type: KwaZulu-Natal, no precise locality, *Cooper s.n.* (K!, holo.; PRE, photo.!).

A. schmidtiana Regel: 97, 98, t. 970 (1879); Glen & G.F.Sm.: 38 (1995). Lecto-iconotype: *Gartenflora* 1879: 97, t. 970.

Apparently stemless grass aloe 0.6–1.2 m tall, solitary or in small groups. *Leaves* 16–20, distichous, rarely spirally twisted to rosulate in old specimens, 400–800 × 25–60 mm, distinctly keeled, V-shaped in section, bright green, undersurface white-spotted near base, margins cartilaginous, dentate. *Inflorescence* a conical, subax raceme; peduncle 0.4–1 m long, with sterile bracts; bracts ovate-acuminate, 13–33 × 6–8 mm, many-nerved. *Flowers* salmon-pink to blood-red, 25–40 mm long; all segments free; pedicels 30–60 mm long, lengthening in fruit. *Anthems* not or hardly exerted. *Ovary* ± 5 × 2 mm; style exerted 3–5 mm. *Fruit* 33–40 × 12–13 mm, grey.

This is the only species of *Aloe* which regularly occurs in marshy places from the Northern

Province to KwaZulu-Natal. It also grows in well drained places, often among rocks on hill-sides.

Aloe cooperi is distinguished from all other species of the genus in southern Africa by its distinctly keeled leaves which are V-shaped in section.

Two subspecies are recognised:

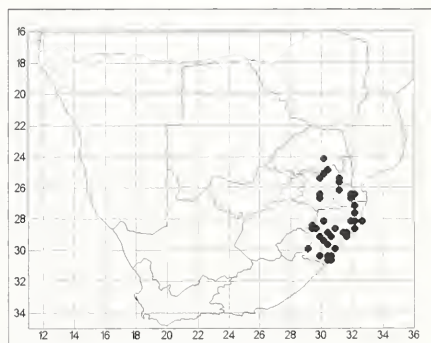
Leaf margins dentate throughout
 21a. subsp. *cooperi*
 Leaf margins entire in upper three quarters, dentate below . . 21b. subsp. *pulchra*

21a. subsp. ***cooperi***.

Description as for the species. *Flowering time* January to March.

Found in the Northern Province, Mpumalanga, Swaziland and KwaZulu-Natal, including one locality on the Free State border. In northern KwaZulu-Natal, where this subspecies is sympatric with subsp. *pulchra*, it grows in drier places at higher altitudes than subsp. *pulchra*. Map 15.

The specific epithet honours Mr T. Cooper, a nurseryman of Reigate, Surrey, England, who collected in the Eastern Cape and KwaZulu-



MAP 15.—*Aloe cooperi* subsp. *cooperi*

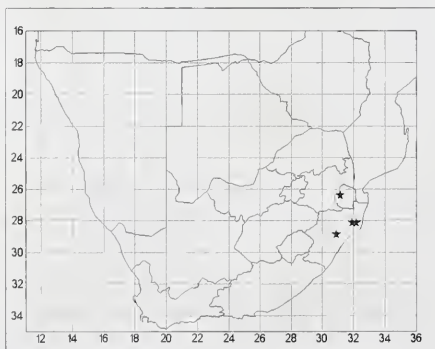
Natal in about 1860. He discovered several new species, of which the type specimens are housed at Kew. He was the father-in-law of N.E. Brown, without whose works students of succulent plants would be infinitely poorer. Zulu common names for this species are *isipukutwane* and *isiputumane* (Reynolds 1950). The burned leaves of this species are used in Zulu magic. The inflorescence is cooked and eaten as a vegetable.

Vouchers: *Acocks* 10063 (NH, PRE); *Compton* 29001 (PRE); *Hardy* 3958 (PRE); *Reynolds* 3447 (PRE); *Srey* 3665 (PRE).

21b. subsp. **pulchra** *Glen & D.S.Hardy* in *The Flowering Plants of Africa* 49: t. 1944 (1987b). Type: KwaZulu-Natal, Palm Ridge, *Harrison* 980 (PRE!).

Leaves always distichous, with margins dentate only in basal quarter, entire above; lower surface with white tubercles each bearing a hair-like process near base. *Bracts* clasping pedicels. *Flowers* slightly longer than in subsp. *cooperi*, 35–45 mm long, deep to pale pink. *Flowering time* April to May. Other characters as in subsp. *cooperi*.

Occurs in KwaZulu-Natal with outliers in Swaziland, in rough grassland and thorny forest margins, often in association with *Erythrina latissima*. Map 16.



MAP 16.—*Aloe cooperi* subsp. **pulchra**

Plants of this subspecies are strikingly beautiful when in flower, and so the subspecies is named accordingly. It occurs at lower altitude, in moister places than subsp. *cooperi* where the two are sympatric.

Vouchers: *Culverwell* 598 (PRE); *Harrison* 506 (PRE); *Hitchins* 32 (NPB, PRE), *Letley* H15 (NPB, PRE); *C.J. Ward* 2344 (PRE).

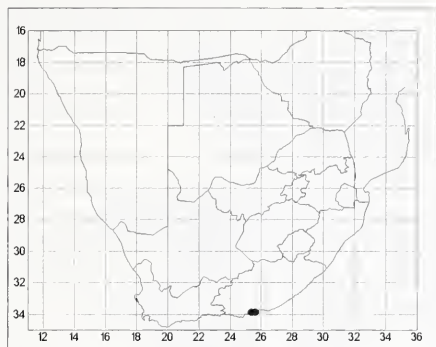
22. ***Aloe bowiea* Roem. & Schult.f.**, *Systema vegetabilium* 7: 704 (1829); Baker: 158 (1880a); Baker: 309 (1896a); Oberm.: 119 (1973); D.S.Hardy: 518 (1974); G.F.Sm.: 10 (1983); G.F.Sm.: 80 (1990a); G.F.Sm.: 303 (1990b); G.F.Sm.: 415 (1990c); G.F.Sm.: 9 (1991); G.F.Sm. & A.E. van Wyk: 93 (1993); G.F.Sm. *et al.*: 80, t. 2096 (1994); B.-E. van Wyk & G.F.Sm.: 238 (1996). Iconotype: Duncanson, unpublished plate at K.

Bowiea africana Haw.: 299 (1824). *Chamaeloe africana* (Haw.) A.Berger: 120 (1908). Type as above.

Stemless grass aloe 75–100 mm tall, usually in large groups. *Leaves* many in a rosette, linear, 70–125 × 4–15 mm, channelled, expanded at base, undersurface with white spots, margins dentate. *Inflorescence* a dense, cylindric raceme; peduncle 150–400 mm long, with sterile bracts; bracts narrowly deltoid-acuminate, ± 3–6 × 2 mm, 3-nerved. *Flowers* sessile, greenish white, 8–10 mm long, mouth expanded; all segments free. *Anthers* not or hardly exerted. *Ovary* ± 2–3 × 1 mm; style exerted 2–3 mm. *Fruit* not seen. *Flowering time* March to April.

Endemic to the Eastern Cape. *A. bowiea* occurs in soil varying from sandy loam to heavy clay, among grasses, succulents and stones in valley bushveld (Smith & Van Wyk 1990). Map 17.

The leaves of this species are similar in form to those of *A. chortolirioides* (no. 9), but differ in size from that species. Plants of this species are single-headed, whereas *A. chortolirioides* is characterised by vast, multiheaded clumps. The flower recalls *A. saundersiae* (no. 1), *A. albidia* (no. 2) and *A. inconspicua* (no. 7) in its small

MAP 17.—*Aloe bowiea*

size and greenish white colour. It differs from all of these in that the anthers and style are exerted ± 2 mm, whereas in most members of this section, the anthers and style are included, as long as the perianth or hardly exerted.

This species is named after James Bowie, its discoverer, who collected plants at the Cape from 1816–1823 and sent a living plant to Kew, where it was figured by Duncanson and described by Haworth. Smith (1983) states that some populations of this species are eaten by stock.

Vouchers: *Hall 1612* (NBG); *Hardy 2184* (PRE); *Reynolds 1206* (PRE); *Schönland s.n.* (BOL, GRA).

2. Section *Haemanthifoliae*

Section *Haemanthifoliae* (A.Berger) Glen & D.S.Hardy, stat. nov. Type species: *A. haemanthifolia* A.Berger & Marloth.

Series *Haemanthifoliae* A.Berger in Das Pflanzenreich 33: 173 (1908); Reynolds: 155 (1950).

Plants stemless, 400–700 mm tall, usually in groups, rarely solitary. *Leaves* distichous, broadly lorate, $180\text{--}210 \times 42\text{--}100$ mm, apices rounded, fibrous, dull green, margins entire. *Inflorescence* a simple capitate raceme; peduncle 300–450 mm long, with sterile bracts; bracts lanceolate-acuminate, $11\text{--}25 \times 4\text{--}7$ mm, 3–7-nerved. *Flowers* orange-red or scarlet, 23–38 mm long, cylindric; inner and outer segments free; pedicels ± 25 mm long, extending to 40–55 mm in fruit. *Anthers* and style included. *Ovary* $\pm 8 \times 3$ mm, tapering into style. *Fruit* dark grey, with transverse ribs, $\pm 25 \times 14$ mm. *Seeds* dark grey, with narrow wings, $\pm 5.0 \times 4.0 \times 2.5$ mm. *Flowering time* October.

23. *Aloe haemanthifolia* A.Berger & Marloth, A.Berger in Botanische Jahrbücher 38: 85 (1905b); A.Berger: 173 (1908); V.Higgins: 273 (1944); Reynolds: 155 (1950); Jeppe: 66 (1969); Bormman & D.S.Hardy: 47 (1972); Glen & C.Craib: t. 2063 (1993); B.-E. van Wyk & G.F.Sm.: 140 (1996). Type: Western Cape, Franschhoek Mountains, *Marloth 3786* (BOL, hol.!: GRA!, PRE!).

Description as for section. Figure 2.

Endemic to the Western Cape. *A. haemanthifolia* occurs on Table Mountain sandstone cliffs in the Cape folded mountains, in very wet places.

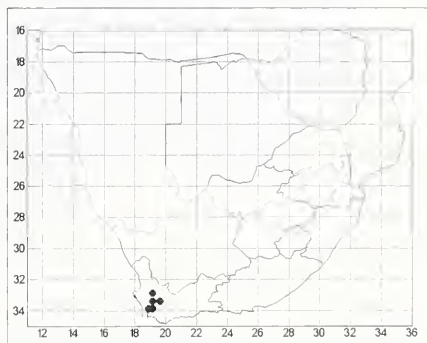
MAP 18.—*Aloe haemanthifolia*



FIGURE 2.—Section *Haemanthifoliae*. *Aloe haemanthifolia*: 1, inflorescence, $\times 0.9$; 2, habit, $\times 0.7$. Taken from Glen & Craib (1993).

One population is in the spray of a waterfall. The surrounding vegetation is fynbos. In summer these mountains are not warm, and in winter the habitat of this species is above the snow line. Map 18.

This is one of two species of *Aloe* (the other being *A. fibrosa* from Kenya) to have distinct fibres in the leaves. Its large, distichous, leathery, linear, obtuse leaves, stemless habit and capitate racemes of flowers with long perianths

and included anthers and styles distinguish this species from all others in the genus.

Evidently the leaves of this species reminded Marloth and Berger of those of a *Haemanthus* (a well-known genus of bulbous plants).

Vouchers: *Compton 17507* (NBG); *Esterhuysen 29668* (BOL, PRE); *Leighton 1365* (BOL); *Phillips 1347* (SAM); *Van Jaarsveld 2719* (NBG).

3. Section **Longistylae**

Section **Longistylae** (*A. Berger*) *Glen & D.S. Hardy*, stat. nov. Type species: *A. longistyla* Baker.

Series *Longistylae* *A. Berger* in *Botanische Jahrbücher* 36: 49 (1905a); *A. Berger*: 174 (1908); *Reynolds*: 158 (1950).

Plants stemless. *Leaves* rosulate, lanceolate, variously dentate. *Inflorescence* a simple, densely flowered, cylindric to conical raceme; peduncle with many sterile bracts; pedicels short to 0 except in *A. chlorantha*. *Flowers* red, yellow or green, with straight or upturned mouth. *Anthers* much exserted. *Style* much exserted.

1a Leaves with surface prickles:

2a Leaves shorter than 160 mm; surface prickles randomly arranged 24. *A. longistyla*

2b Leaves longer than 160 mm; surface prickles in median line 25. *A. peglerae*

1b Leaves without surface prickles:

3a Pedicels shorter than 10 mm; flowers yellow 26. *A. broomii*

3b Pedicels longer than 10 mm; flowers green 27. *A. chlorantha*

These stemless species inhabit some of the coldest parts of southern Africa. The group as a whole may be recognised by the absence of erect stems, the simple inflorescences with dense, sessile to shortly pedicellate tubular flowers and long-exserted anthers and styles.

24. *Aloe longistyla* Baker in *Journal of the Linnean Society of London, Botany* 18: 158 (1880a); Baker: 309 (1896a); *A. Berger*: 174 (1908); *Pole Evans*: t. 315 (1928a); *Reynolds*: 159 (1950); *Jepp*: 35 (1969); *Bornman & D.S. Hardy*: 49 (1972); *Glen & G.F.Sm.*: 38 (1995); *B.-E. van Wyk & G.F.Sm.*: 244 (1996). Type: Eastern Cape, Graaff-Reinet, *Bolus 689* (K, lecto.!, PRE, photo.!).

Plants 150–250 mm tall, in groups. *Leaves* 20–30, biconvex, 60–150 × 20–40 mm, glaucous blue-green, both surfaces with white prickles,

margins dentate. *Inflorescence* a dense, capitate, conical raceme; peduncle 150–270 mm long; bracts ovate-deltoid, acuminate, 19–30 × 7–15 mm, slightly fleshy, 7–many-nerved. *Flowers* sessile or on pedicels up to 8 mm long, salmon-pink to flame-red, 35–55 mm long, mouth upturned; outer segments connate for three quarters of their length, inner segments free but dorsally adnate to outer. *Anthers* exserted 5–20 mm. *Ovary* ± 7–10 × 4 mm, green; style exserted 16–25 mm. *Fruit* ± 50 × 30 mm, green to grey. *Seeds* charcoal-grey, ± 12.0 × 13.0 × 0.8 mm, including buff wing 5–6 mm wide. *Flowering time* July to September.

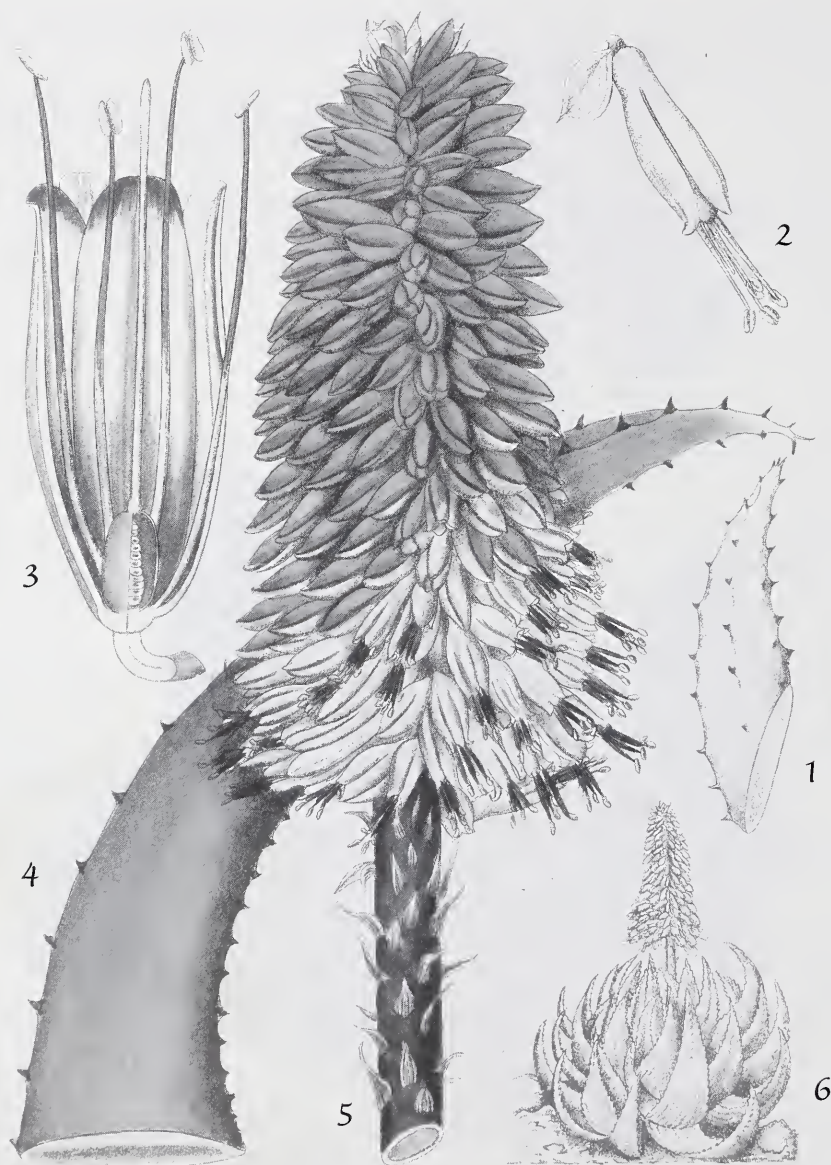
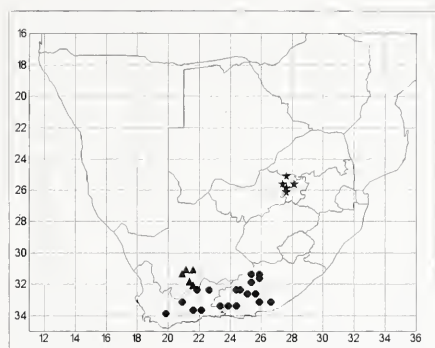


FIGURE 3.—Section Longistylae. *Aloe peglerae*: 1, upper portion of leaf; 2, flower; 3, median longitudinal section of flower; 4, leaf, $\times 0.8$; 5, inflorescence, $\times 0.8$; 6, habit, much reduced. Taken from Pole Evans (1924c).



MAP 19.—● *Aloe longistyla*
★ *A. peglerae*
▲ *A. chlorantha*

Endemic to the Western and Eastern Cape. This species grows on clay soils in the karoo. It may be found on bare soil, but is more often protected by small karoo bushes (species of *Pentzia* and similar genera). Map 19.

The specimen *Bolus* 689 is chosen as a lectotype rather than *Drège* 8640 because of its more detailed locality. *Aloe longistyla* has the longest styles in the genus. They may be as long as 75 mm when fully exerted. Schönland (quoted by Reynolds 1950) states that in the flowers of this species the stigmas are receptive before the pollen is shed. This would be unusual, as in most species of *Aloe* pollen is shed in the early morning, stigmas reaching maximum sensitivity about or shortly after noon on the same day. The stemless clumped habit, stout unbranched peduncles and long, upturned flowers distinguish this species from all others in the genus.

The specific epithet draws attention to the long styles, which are a characteristic feature of the flowers of this species.

Vouchers: *Dyer* 4024 (PRE, SAM, UPS); *MacOwan* 2230B (BM); *Marloth* 5134 (PRE); *Reynolds* 5490 (BOL, NH, PRE); *Rogers* 30230 (K).

25. *Aloe peglerae* Schönland in Records of the Albany Museum 1: 120 (1904); A. Berger: 174 (1908); Pole Evans: t. 149 (1924c); Reynolds: 160 (1950); Jeppe: 5 (1969); Borman & D.S. Hardy: 51 (1972); B.-E. van Wyk & G.F. Sm.: 150 (1996). Type: North-West, Rustenburg, *Pegler* 921 (BOL, holo.; GRA!, PRE!, SAM!).

Plants solitary, 350–450 mm tall. *Leaves* \pm 30, arcuate-incurved, 175–250 \times 50–70 mm, greyish, undersurface with a median line of prickles near apex, margins dentate. *Inflorescence* a dense, cylindric raceme; peduncle 300–400 mm long; bracts ovate-acuminate, 12–16 \times 6–7 mm, 3–7-nerved. *Flowers* magenta-red in bud, greenish cream when open, 25–30 mm long, cylindric, mouth very slightly upturned; all segments free. *Anthiers* exerted 7–25 mm, purple. *Ovary* \pm 6 \times 3 mm, green; style exerted 15–20 mm, pale brown. *Fruit* not seen. *Flowering time* July to August. Figure 3.

Endemic to North-West and Gauteng. *Aloe peglerae* formerly occurred in large numbers on stone pavements on the Witwatersrand, but has largely been exterminated by urban development and collectors. Where it still occurs, it is found in places with almost no soil; most of such little soil as there is, is humus formed by the decay of old leaves of this plant. The surrounding vegetation is scanty grassland. Map 19.

This species is similar to *A. broomii* (no. 26) and *A. chlorantha* (no. 27) in its solitary habit and incurved leaves. Unlike these two species, in which the leaves are yellow-green, the leaves of *A. peglerae* are glaucous blue. It is smaller than these in all parts except the flower. The leaves have a median line of prickles on the lower surface near the apex, and the brilliant red flowers and small bracts of this species contrast with the dull brownish or greenish flowers, half hidden by the bracts, in the other two species mentioned.

Most of Alice Pegler's collections are from the Kentani district of Transkei, but a few, such as the type of this species named after her, are from near Rustenburg in North-West.

Vouchers: *Burt Davy 10428* (K); *Marloth 5975* (PRE); *Reynolds 2877* (PRE); *C.A. Smith 6270* (PRE); *Young 3020* (PRE).

26. *Aloe broomii* Schönland in *Records of the Albany Museum* 2: 137 (1907); A.Berger: 329 (1908); Pole Evans: t. 605 (1936e); Reynolds: 162 (1950); Jeppe: 54 (1969); Bornman & D.S.Hardy: 53 (1972); B.-E. van Wyk & G.F.Sm.: 124 (1996). Type: Eastern Cape, Pam-poenoort, *Broom s.n.* (GRA!).

Plants usually solitary, 0.5–1 m tall excluding inflorescence. *Leaves* many in a rosette, erect to spreading, 200–400 × 55–105 mm, upper surface flat, lower surface convex, green to yellow-green, rarely with a median line of prickles in apical third, margins dentate. *Inflorescence* a cylindric raceme; peduncle 0.75–1.5 m long; bracts spatulate, 21–30 × 11–15 mm, many-nerved. *Flowers* lemon-yellow, 20–25 mm long, mouth slightly upturned; all segments free; pedicels 0 or up to 2 mm long. *Anthers* exserted 2–12 mm. *Ovary* lemon-yellow, 4–5 × 2–3 mm; style exserted 11–15 mm. *Fruit* not seen.

Two varieties are recognised:

Buds hidden by enclosing bracts

. 26a. var. *broomii*

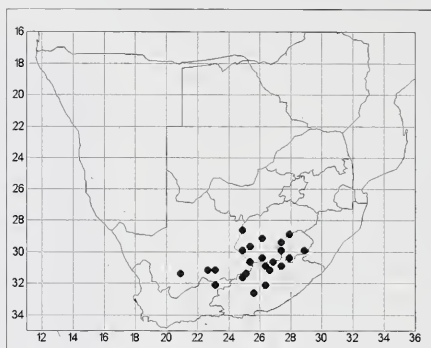
Buds not hidden by bracts . . 26b. var. *tarkaensis*

26a. var. *broomii*.

Description as for species. *Flowering time* in spring, after main cold season (August to October).

Found in the Northern Cape, Free State, Lesotho and the Western and Eastern Cape. *Aloe broomii* var. *broomii* occurs on ironstone ridges in the coldest parts of the eastern karoo, among grasses and karoo bushes. Map 20.

The long inflorescences of yellow to brownish flowers on short pedicels distinguish this



MAP 20.—*Aloe broomii* var. *broomii*

species from *A. chlorantha* (no. 27). Further characters distinguishing between these two species are found in the microscopical structure of the leaves. As these characters are not readily observable, they are not discussed here. Differences between this species and *A. peglerae* (no. 25) are discussed under that species.

This species features in one of the very few identifiable Bushman paintings of plants. Its Afrikaans common name is *bergaalwyn* (Reynolds 1950). The specific epithet honours its discoverer, Dr Robert Broom, the palaeo-anthropologist. It is reported that *A. broomii* is used in the following manner to remove ticks from horses: the affected horse is given two tablespoons of leaf sap, whereupon its blood becomes so bitter that the ticks fall off. Reynolds, in a note in the PRE archives, records an experiment to test this remedy on sheep. It was found that the effect was of very short duration (± 15 minutes), and so the ticks fell into the sheep's wool and soon reattached themselves to the animal.

Vouchers: *Acocks 16431* (PRE); *Dieterlen 1150* (PRE, SAM); *Henrici 265* (PRE); *Muller 1019* (PRE); *Reynolds 1612* (PRE, SAM).

Hybrids:

1. *A. broomii* var. *broomii* × *A. grandidentata* (no. 58). Voucher: *Muller 1022* (PRE).

2. *A. broomii* var. *broomii* \times *A. claviflora* (no. 70). Voucher: *Wilman 13324* (PRE).

3. *A. broomii* var. *broomii* \times *A. hereroensis* var. *hereroensis* (no. 76a). Voucher: *Reynolds 4612* (PRE).

4. *A. broomii* var. *broomii* \times *A. ferox* (no. 110). Voucher: *Reynolds 1615* (BM, PRE).

26b. var. ***tarkaensis*** *Reynolds* in *Journal of South African Botany* 2: 72 (1936b); *Reynolds*: 165 (1950); *Jeppe*: 54 (1969); *Bornman & D.S.Hardy*: 53 (1972). Type: Eastern Cape, Tarkastad, *Reynolds 1777* (PRE, holo.!, SAM!).

Leaves larger, up to 500 \times 150 mm or more. *Flowers* longer, 20–30 mm long; style exserted 15–20 mm; pedicels longer, 3–4 mm; bracts lanceolate, \pm 12 \times 5 mm. Other characters as for species.

Found on low, stony ridges in the Northern and Eastern Cape, rarely on grassy flats. Map 21.

This variety flowers in late summer to autumn (February to March). In this variety the bracts are much smaller than in the typical variety. It seems that these differences are connected in the following manner: in var. *tarkaensis*, the seeds are ripened before the coldest part of winter, rendering large protective bracts unnecessary, whereas in the typical variety the inflo-

rescence overwinters as a bud, and the large bracts perform some function in protecting the unopened flowers from the intense cold of the winter months in the natural range of this species.

The varietal epithet indicates that the plants grow not far from Tarkastad, in the Eastern Cape. Tarkastad takes its name from the nearby Tarka River. *Tarka* is a Khoi word which may be translated as 'River of Women'.

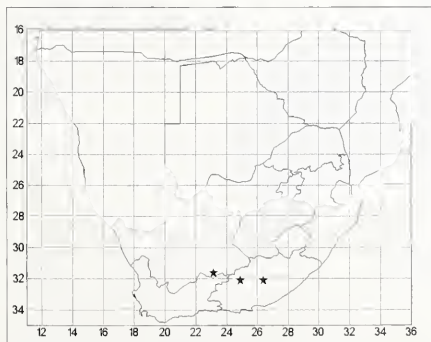
Vouchers: *Glen 1581* (PRE); *Reynolds 1776* (PRE); *Story 2493* (PRE).

27. ***Aloe chlorantha*** *Lavranos* in *Journal of South African Botany* 39: 87 (1973a); *D.S.Hardy*: 523 (1974) B.-E. van Wyk & G.F.Sm.: 124 (1996). Type: Northern Cape, Fraserburg District, *Lavranos 10024* (PRE, holo.!).

Plants usually in small groups, 0.5–1 m tall excluding inflorescence. *Leaves* \pm 30 in a rosette, erect to arcuate-incurved, 250–400 \times 50–80 mm, slightly biconvex, green to purplish, lower surface often white-spotted, margins cartilaginous, dentate. *Inflorescence* a cylindric, subdense raceme; peduncle 0.7–1.6 m long; bracts narrowly deltoid-acuminate, 12–20 \times 4–8 mm, many-nerved. *Flowers* yellow-green, 10–12 mm long, cylindric; all segments free; pedicels 12–22 mm long. *Anthers* exserted 2–3 mm. *Ovary* bright green, \pm 3.0 \times 1.5 mm; style exserted 2–4 mm. *Fruit* not seen. *Flowering time* September to November.

Aloe chlorantha is endemic to the southern region of the Northern Cape and is restricted to the tops of a few ridges in the upper karoo, where it is commonly wedged between dolerite boulders. Map 19.

The small greenish (not yellow to brown) flowers on long pedicels distinguish this species from *A. broomii* (no. 26). In addition, the raceme in this species is much shorter in relation to the peduncle than in *A. broomii*.



MAP 21.—*Aloe broomii* var. *tarkaensis*

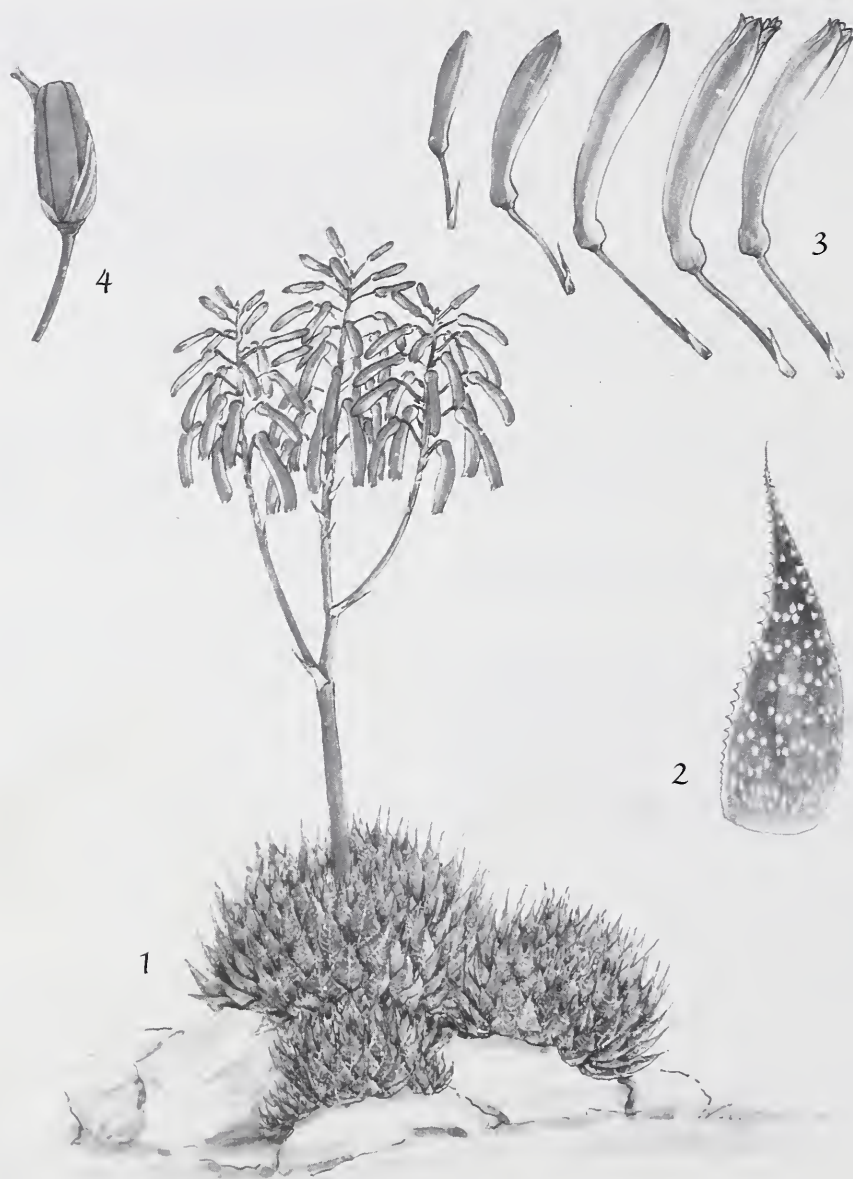


FIGURE 4.—Section *Aristatae*. *Aloe aristata*: 1, habit; 2, leaf; 3, flowers from bud to anthesis, $\times 0.9$; 4, fruit, $\times 0.9$. Taken from Jeppe (1969).

Characters distinguishing between this species and *A. peglerae* (no. 25) are discussed under that species.

The specific epithet is a combination of two Greek words meaning 'green flowers'. Lavranos

(1973a) reports in the first description that the inflorescences are eaten by dassies (*Procapra capensis*). This may explain the almost total absence of young plants in the field.

Voucher: *Lavranos 10024* (PRE).

4. Section *Aristatae*

Section *Aristatae* (*A. Berger*) *Glen & D.S. Hardy*, stat. nov. Type species: *A. aristata* Haw.

Series *Aristatae* *A. Berger* in *Botanische Jahrbücher* 36: 46 (1905a); *A. Berger*: 175 (1908); *Reynolds*: 169 (1950).

Plants stemless, ± 100 mm tall excluding inflorescence, usually in dense clusters. *Leaves* 100–150 in a rosette, lanceolate, arcuate-incurved, $50\text{--}110 \times 10\text{--}17$ mm, greyish green to blue-green, with white subtuberculate to subspinescent spots on both surfaces, those on lower surface sometimes forming transverse bands, lower surface with soft prickles in median rows, margins with soft white teeth, apices apiculate. *Inflorescence* 300–500 mm high, usually 2–6-branched; peduncles without sterile bracts; floral bracts narrowly deltoid-acuminate, $\pm 12 \times 3$ mm, obscurely ± 5 -nerved. *Flowers* brownish orange above, much paler below, 30–40 mm long, arcuate-nutant at anthesis, slightly constricted above ovary; outer segments connate for most of their length, inner segments adnate to outer; pedicels 21–35 mm long. *Anthems* not or hardly exerted. *Ovary* 6.0–8.0 \times 1.0–2.5 mm, olive-green; style exerted 1–2 mm. *Fruit* 25–30 \times 8–10 mm, grey to greenish brown. *Seeds* grey, $\pm 6.0 \times 3.0 \times 1.5$ mm, narrowly winged. *Flowering time* August to October.

28. *Aloe aristata* Haw. in *The Philosophical Magazine* 66: 280 (1825); *Baker*: 306 (1896a); *A. Berger*: 176 (1908); *Reynolds*: 169 (1950); *Jepp*: 15 (1969); *Bornman & D.S. Hardy*: 55 (1972); *Glen & G.F.Sm.*: 38 (1995). Neotype: Northern Cape, near Steynsburg, *Reynolds 1024* (PRE!).

A. longiaristata Schult. & Schult.f.: 684 (1829); *Salm-Dyck*: 15, t. 7 (1837); *Glen & G.F.Sm.*: 38 (1995). Neotype: *Salm-Dyck*. Monographia generum Aloes et Mesembryanthemi 15: t. 7 (1837).

A. aristata Haw. var. *leiophylla* *Baker*: 156 (1880a); *Baker*: 307 (1896a); *A. Berger*: 176 (1908). Type: Cape, no precise locality, *Cooper s.n.* (K!).

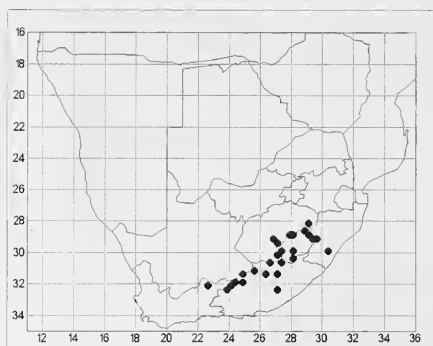
A. aristata Haw. var. *parviflora* *Baker*: 307 (1896a); *A. Berger*: 177 (1908). Type: South Africa, no precise locality, *Cooper s.n.* (K!).

A. ellenbergii *Guillaumin*: 119 (1934). Type: Lesotho, no precise locality, *Ellenberg sub Baltzer f27* (P).

Description as for section. Figure 4.

Found in the Free State, KwaZulu-Natal, Lesotho and the Western and Eastern Cape. *Aloe aristata* occurs in a wide variety of habitats, including sandy soil in hot, dry karoo areas, deep shade on humus-rich soil in riverine forest and grassland on high mountains in Lesotho. In dry karroid areas the leaves are greyish, erect, longer and narrower than usual, with more pronounced tubercles. In grassland in wetter areas the leaves are bright green, broader than usual and spreading, sometimes even slightly reflexed in very damp shade. Map 22.

Many characters make this species quite unmistakable for any other in the genus. The dry awn-tipped leaf apices and leaf tubercles are unique among southern African species of *Aloe*. Outside the FSA region, they are found only in *A. laworthioides*, a Madagascan species. The long, downward-curved flowers with slight basal swellings are unique in the genus, and this species, more than any other, has a tendency

MAP 22.—*Aloe aristata*

towards flowers and pedicels that are darker in colour above (where they receive direct sunlight) than below (where they are in their own shadow).

The specific epithet refers to the awn-tipped leaves which are very characteristic of this species. Its seSotho common name is *serelei* (Reynolds 1950). In Lesotho it is used in fertility rites.

Vouchers: *Davidson 3048* (J, PRE); *Gerstner 52* (PRE); *Killick 1631* (BOL, NH, PRE); *Reynolds 2180* (PRE, SAM); *Trauseld 441* (NU, PRE).

5. Section *Echinatae*

Section *Echinatae* Salm-Dyck, Monographia generum Aloes et Mesembryanthemi: 15 (1837). Type species: *A. humilis* (L.) Mill.

Series *Echinatae* Salm-Dyck, Reynolds: 173 (1950).

Plants stemless or with short prostrate stems. *Leaves* rosulate, narrow, lanceolate to almost semiterete, variously dentate. *Inflorescence* a simple cylindric-conical, lax to dense raceme; peduncle with many sterile bracts. *Flowers* cylindric; perianth segments usually free or almost free; anthers and style not or hardly exserted.

1a Leaves without surface prickles:

- 2a Leaves spotted on both surfaces; indigenous to Eastern Cape 31. *A. pictifolia*
 2b Leaves unspotted; indigenous to Namaqualand 30. *A. krapohlana*

1b Leaves with surface prickles:

- 3a Plants up to 150 mm tall; leaves with random surface prickles 29. *A. humilis*
 3b Plants taller than 200 mm; leaves with few surface prickles in median line:
 4a Flowers incurved, \pm cylindric; dry leaf sap golden 32. *A. melanacantha*
 4b Flowers straight or with upcurved mouth, subventricose; dry leaf sap lemon-yellow . . .
 33. *A. erinacea*

The species of this group all have narrow, almost subulate leaves and simple inflorescences. The flowers are on relatively long pedicels subtended by long, cuspidate bracts. In three species the leaves have surface prickles, and in the other two they are not thus armed.

29. *Aloe humilis* (L.) Mill., The abridgement of The gardener's dictionary: no. 10 (1771); Thunb.: 61 (1794); DC.: t. 39 (1800); Haw.: 15 (1804); W.T.Aiton: 294 (1811); Haw.: 85 (1812); Thunb.: 311 (1823); Salm-Dyck: 15, t. 1 (1837); Lodd.: t. 1481 (1828); Baker: 307

(1896a); A.Berger: 180 (1908); R.A.Dyer: t. 439 (1931a); Reynolds: 173 (1950); Jeppe: 14 (1969); Bornman & D.S.Hardy: 57 (1972); B.-E. van Wyk & G.F.Sm.: 242 (1996). Iconotype: *Aloe africana humilis spinis inermibus & verrucosis obsita* C.Commelijn, Horti medici Amstel-

aedamensis plantae rariores et exoticae: 46, t. 46 (1706).

A. perfoliata L. o *humilis* L.: 320 (1753); Aiton: 467 (1789).

A. verrucosopiuosa All.: 13 (1773); All.: 65 (1774–1776). Iconotype: *Aloe africana humilis spinis inermibus & verrucis obsita* C. Commelin, Praeludia botanica: 77 (1703).

Catevala humilis (L.) Medik.: 69 (1786). Type: not cited.

A. perfoliata L. μ *suberecta* Aiton: 467 (1789). Type: not cited.

A. humilis (L.) Mill. var. *incurva* Haw.: 15 (1804); Ker Gawl.: t. 828 (1805); Baker: 308 (1896a); A. Berger: 182 (1908); Reynolds: 177 (1950); Glen & G.F.Sm.: 39 (1995). Lecto-iconotype: Curtis's Botanical Magazine 21: t. 828 (1805).

A. suberecta (Aiton) Haw.: 16 (1804); Haw.: 84 (1812). *A. humilis* (L.) Mill. var. *suberecta* (Aiton) Baker: 308 (1896a); A. Berger: 181 (1908); Reynolds: 178 (1950). Type: not cited.

A. tuberculata Haw.: 16 (1804); Haw.: 84 (1812). Type: not cited.

A. echinata Willd.: 385 (1809); Salm-Dyck: 15, t. 2 (1837). Type: not cited.

A. acuminata Haw.: 84 (1812). *A. humilis* (L.) Mill. var. *acuminata* (Haw.) Baker: 157 (1880a); Baker: 308 (1896a); A. Berger: 182 (1908); Reynolds: 178 (1950). Iconotype: Curtis's Botanical Magazine 20: t. 727 (1804).

A. incurva (Haw.) Haw.: 85 (1812); Lodd.: t. 1829 (1829); Salm-Dyck: 15, t. 3 (1837). Type: not cited.

A. suberecta (Aiton) Haw. var. *semiguttata* Haw.: 41 (1821); A. Berger: 181 (1908). Type: not cited.

A. subtuberculata Haw.: 280 (1825). *A. humilis* (L.) Mill. var. *subtuberculata* (Haw.) Baker: 308 (1896a); A. Berger: 182 (1908); Reynolds: 179 (1950). Type: not cited.

A. echinata Willd. var. *minor* Salm-Dyck: 15, t. 2 (1837); Kunth: 516 (1843). Type: not cited.

A. humilis (L.) Mill. var. *candollei* Baker: 157 (1880a); Baker: 308 (1896a). Iconotype: DC.: t. 39 (1800).

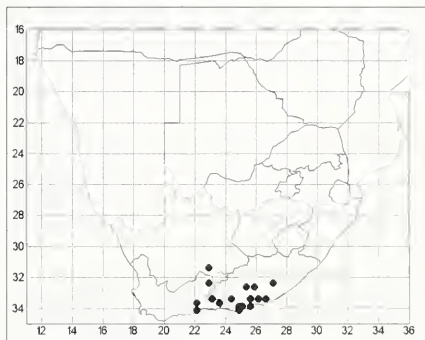
A. humilis (L.) Mill. var. *echinata* (Willd.) Baker: 308 (1896a); A. Berger: 182 (1908); Reynolds: 178 (1950). Type: Hort. Berlin, *Willdenow 6776* (B-W, holo.; PRE, microfiche!).

A. humilis (L.) Mill. var. *incurva* Haw. subvar. *minor* (Salm-Dyck) A. Berger: 183 (1908). Type: not cited.

Plants stemless, 75–150 mm tall, in dense groups. *Leaves* 20–30 in a rosette, narrowly lanceolate to semiterete-acuminate, 50–100 \times 8–20 mm, blue-green, upper surface with few prickles, lower surface with many prickles, margins dentate. *Inflorescence* a lax raceme; peduncle 250–450 mm long; bracts lanceolate-acuminate, 18–25 \times 8–9 mm, many-nerved. *Flowers* red to orange, 23–42 mm long; outer segments connate for one third of their length, inner segments dorsally adnate to the outer; pedicels 20–30 mm long, lengthening to 40 mm in fruit. *Anthers* not or hardly exerted. *Ovary* \pm 7–8 \times 2 mm; style exerted up to 2 mm. *Fruit* 18–38 \times 8–13 mm, grey. *Flowering time* September to December.

A. humilis occurs in the Northern, Western and Eastern Cape, growing in clay soils in Eastern Cape Succulent Veld (noorsveld). Unlike most species in this section, *A. humilis* forms many-headed clumps of plants with small, almost awl-shaped leaves. The leaves have surface prickles, but these are glaucous, whitish or colourless and randomly arranged, unlike those of *A. melanacantha* (no. 32) and *A. erinacea* (no. 33), which are black and arranged in one median line. Map 23.

The specific epithet means 'humble' and refers to the small stature of the plant.



MAP 23.—*Aloe humilis*

Vouchers: *I.L. Drège* 3042 (PRE); *Gibbs Russell* 4317 (PRE); *MacOwan* 2230A (BM, SAM), *Reynolds* 1029 (PRE); *Rodin* 1263 (BOL, K, MO, PRE).

Hybrid:

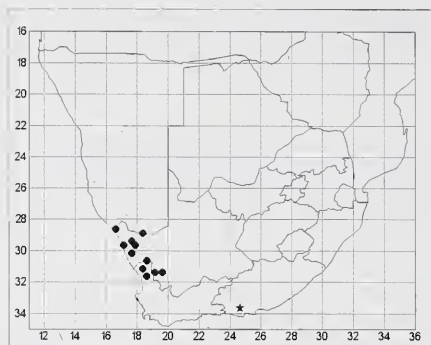
A. humilis × *A. microstigma* subsp. *microstigma* (no. 92a). Voucher: *R. du Plessis* NBG1081/32 (BOL).

30. *Aloe krapohliana* Marloth in Transactions of the Royal Society of South Africa 1: 408 (1909); Pole Evans: t. 201 (1926a); Reynolds: 179 (1950); Jeppe: 34 (1969); Bornman & D.S.Hardy: 59 (1972); B.-E. van Wyk & G.F.Sm.: 144 (1996). Type: Northern Cape, near Pella, *Krapohl in Marloth* 4673 (PRE!).

A. krapohliana Marloth var. *dunoulinii* Lavranos: 41 (1973b); D.S.Hardy: 517 (1974). Type: Northern Cape, Alexander Bay, *Lavranos & Butler* 8777 (PRE!).

Plants stemless or short-stemmed, 150–200 mm tall, solitary or rarely in small clumps. *Leaves* 20–30, 100–200 × 20–40 mm, upper surface flat, lower surface convex, glaucous brownish green, margins with minute white teeth or apparently unarmed. *Inflorescence* a simple, rarely branched, dense raceme; peduncle 300–400 mm long; bracts lanceolate-acuminate, ± 14–16 × 5 mm, many-nerved. *Flowers* scarlet, 23–35 mm long, mouth slightly upturned; pedicels 15–20 mm long. *Anthems* exerted 0–3 mm. *Ovary* ± 6.0 × 1.5–2.5 mm, pale green; style exerted up to 3 mm. *Fruit* 25–30 × 16–17 mm, grey. *Flowering time* June to August.

Endemic to Namaqualand (Northern and Western Cape), *A. krapohliana* occurs on clay, stony (quartzite) and sandy soils in succulent and nonsucculent karoo in the winter-rainfall area. Plants on clay soils at high altitude are much larger than those on sandy soils on the coastal plain, while those on low-altitude stony soils are intermediate in size. The flowering season from June to August is unusual for an aloe of the winter-rainfall area. Map 24.



MAP 24. ● *Aloe krapohliana*
★ *A. pictifolia*

The usually solitary habit and unarmed, unspotted leaves distinguish this species from others in this section.

This species is named after Mr H.C. Krapohl, the collector of the type specimen. The specimen was grown to flowering in Mr Krapohl's garden in Cape Town.

Vouchers: *Compton* 20563 (NBG); *Hall* 883 (NBG); *Hardy* 99 (PRE); *Marloth* 6830 (PRE); *Reynolds* 5456 (PRE).

Hybrids:

1. *A. krapohliana* × *A. arenicola* (no. 88). Voucher: *Hall* 884 (NBG).

2. *A. krapohliana* × *A. garipeensis* (no. 93). Voucher: *S.W. van der Merwe s.n.* (PRE).

31. *Aloe pictifolia* D.S.Hardy in Bothalia 12: 62 (1976); B.-E. van Wyk & G.F.Sm.: 178 (1996). Type: Eastern Cape, near Patensie, *Marais* PRE32328 (PRE!).

Plants short-stemmed, 200–300 mm tall, in small, dense clumps. *Leaves* 16–40 in a rosette, narrowly lanceolate, 120–175 × 10–25 mm, blue-grey-green, with many white spots on both surfaces, margins minutely dentate. *Inflorescence* a subax raceme; peduncle 200–400 mm long; bracts spatulate, obtuse, 6–10 × 2–4 mm,

7-nerved. *Flowers* scarlet, 15–18 mm long, cylindric; pedicels 10–15 mm long. *Anthers* exserted up to 2 mm. *Ovary* $\pm 2.5\text{--}4.0 \times 1.5$ mm; style exserted up to 2 mm. *Fruit* not seen. *Flowering time* June.

Endemic to the Eastern Cape, *A. pictifolia* occurs in Cape sourveld, in an area receiving rain at any season, with a peak in summer. Map 24.

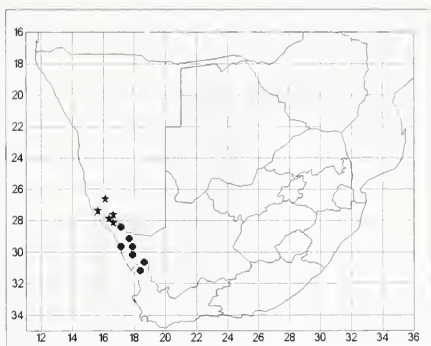
The copiously spotted leaves distinguish this species from others in the section. Individual heads resemble plants of *A. krapohlana* (no. 30), but that plant is solitary, not clumped, the background colour of the leaves in *A. pictifolia* is purplish glaucous, not brownish glaucous as in *A. krapohlana*, and the ecological requirements of these two species are quite different.

The 'painted-leaved' aloe is named for the white spots on the leaves.

Voucher: *Marais* PRE32328 (PRE).

32. ***Aloe melanacantha*** A.Berger in Botanische Jahrbücher 36: 63 (1905a); A.Berger: 217 (1908); Pole Evans: t. 433 (1931a); Reynolds: 181 (1950); Jeppe: 25 (1969); Bornman & D.S.Hardy: 61 (1972); B.-E. van Wyk & G.F.Sm.: 148 (1996). Type: Northern Cape, near Garies, *Drège* 2697 (W).

Plants short-stemmed, 200–300 mm tall excluding inflorescence, usually solitary. *Leaves* densely rosulate, narrowly lanceolate, 80–200 \times 20–40 mm, upper surface flat, lower surface convex, obscurely carinate towards apex, yellowish to brownish green, keel with a row of black or white prickles, margins with hard, black or white, pungent teeth, apex with a hard, black, pungent spine. *Inflorescence* a dense raceme; peduncle 0.4–1 m long; bracts narrowly lanceolate-acuminate, 25–35 \times 5–8 mm, 3–5-nerved. *Flowers* scarlet in bud, yellowish at flowering, incurved, \pm cylindric, 35–45 mm long; pedicels 15–25 mm, lengthening in fruit. *Anthers* exserted 3–5 mm. *Ovary* 6–7 \times 2–3 mm, green; style exserted 4–7 mm. *Fruit* $\pm 28 \times 12$ mm, grey. *Flowering time* May to July.



MAP 25.—● *Aloe melanacantha*
★ *A. erinacea*

Occurring in the Northern and Western Cape, this species grows on rocky hillsides with little soil, in succulent karoo with winter rainfall. The record of *A. melanacantha* from Namibia quoted by Sölch, Roessler & Merxmüller (1970: 17) is based on a misidentification; the plant referred to there is *A. erinacea* (no. 33). Map 25.

Aloe melanacantha is similar in appearance to *A. erinacea*, but there are several characters that may be used to distinguish them. In *A. melanacantha*, plants are solitary and the leaf sap dries a rich golden colour. The flowers are distinctly incurved, the leaves are dark green and relatively flat, and plants flower freely both in nature and cultivation. In *A. erinacea*, on the other hand, plants usually sucker to form clumps, and the leaf sap dries lemon-yellow. Rosettes are more compact, leaves are shorter and more biconvex, and the flowers are not incurved, shorter and subventricose. Both in nature and cultivation plants are rarely seen to flower.

The black teeth and prickles on the leaves gave rise to the specific epithet, which is derived from two Greek words meaning 'black thorns'.

Vouchers: *Hall* 938 (NBG, PRE); *Hardy* 220 (PRE); *Oliver, Tölken & Venter* 237 (PRE); *Reynolds* 2542 (PRE); *Schlieben* 9007 (BM, MO, PRE, SRGH).

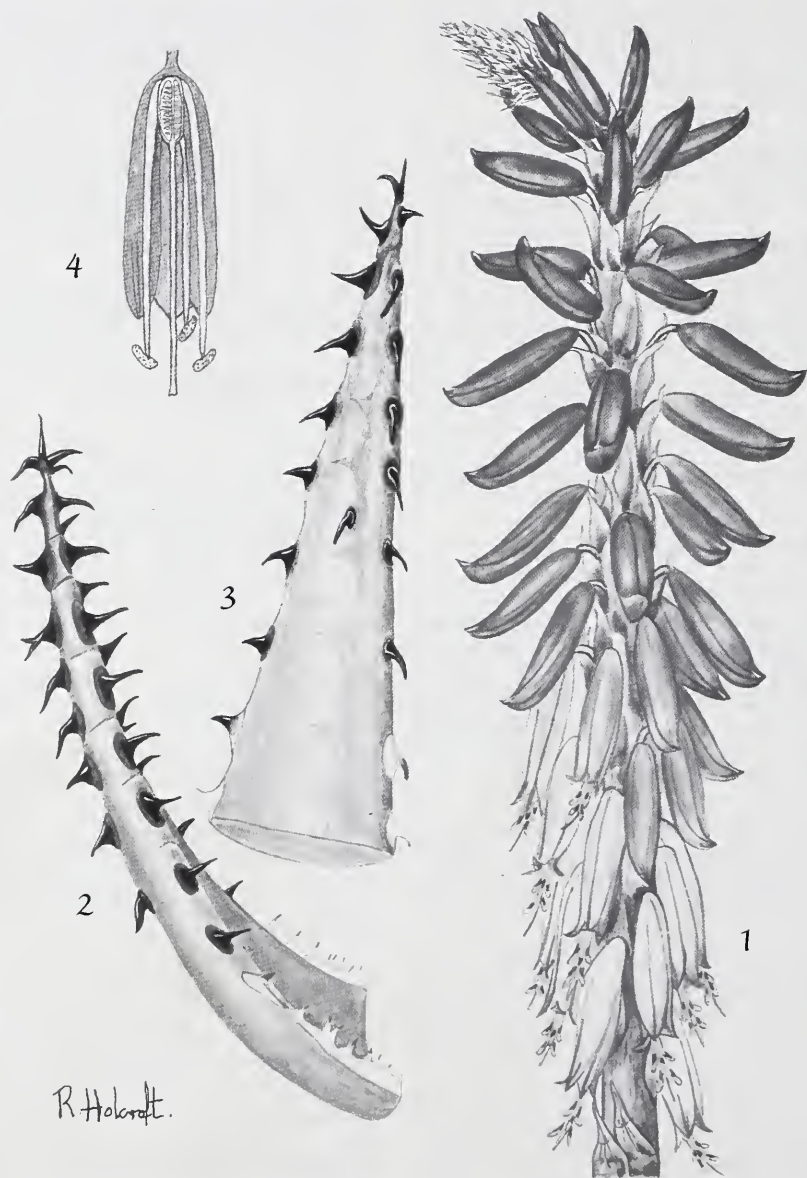


FIGURE 5.—Section *Echinatae*. *Aloe erinacea*: 1, raceme, $\times 0.8$; 2, mature leaf showing distinctive black marginal teeth, $\times 0.8$; 3, young leaf, $\times 0.8$; 4, longitudinal section of flower, $\times 1.2$. Taken from Hardy (1984).

33. **Aloe erinacea** D.S.Hardy in Bothalia 10: 366 (1971); Bornman & D.S.Hardy: 63 (1972); D.S.Hardy: 518 (1974); Jankowitz: 24 (1975); D.S.Hardy: t. 1885 (1984). Type: Namibia, Witputs South, Hardy 2619 (PRE!).

Plants stemless, 200–300 mm tall, usually in small compact clumps. *Leaves* densely rosulate, deltoid-lanceolate, 80–160 × 30–40 mm, biconvex, grey-green or grey-blue, upper surface often with black prickles, lower surface obscurely keeled towards apex, keel with a row of black prickles, margins armed with hard, black, pungent teeth, apex with a hard, black pungent spine. *Inflorescence* a subdense raceme; peduncle up to 1 m long; bracts deltoid-acute, 25.0–27.0 × 4.5 mm. *Flowers* crimson in bud, yellowish orange at flowering, subventricose, 25–30 mm long, mouth slightly upturned; pedicels 18–20 mm long. *Anthers* exserted ± 4 mm. *Ovary* 5.0–6.0 × 2.0–2.5 mm, greenish

brown; style exserted ± 7 mm. *Fruit* not seen. *Flowering time* May to August. Figure 5.

Aloe erinacea is endemic to southern Namibia and grows in pockets of sandy soil on rocky outcrops in the part of the Namib Desert with very low winter rainfall. It is most common in parts of the Sperrgebiet. Map 25.

Differences between this species and *A. melanacantha* (no. 32) are dealt with above.

Erinaceus is a rare Latin word, apparently used in classical times only by the elder Pliny, for a hedgehog. The fortunes of the word improved later, and it is now the generic name of the European hedgehog. The allusion is to the dense rosettes of spiny leaves.

Vouchers: Giess 12793 (PRE); Jankowitz 291 (PRE); Otzen PRE38606 (PRE); Rusch in Dinter 8355 (K).

6. Section **Proliferae**

Section **Proliferae** Salm-Dyck, Monographia generum Aloes et Mesembryanthemi: 16 (1863). Type species: *A. brevifolia* Mill.

Series *Proliferae* Salm-Dyck, A.Berger: 185 (1908); Reynolds: 183 (1950).

Plants stemless, 100–150 mm tall excluding inflorescence, suckering to form dense clumps. *Leaves* 30–40 in a rosette, lanceolate-deltoid, 40–100 (120–150 in *A. brevifolia* var. *depressa*) × 20–50 (–60 in *A. brevifolia* var. *depressa*) mm, blue-grey, upper surface flat to slightly convex, lower surface convex with few soft prickles, margins dentate. *Inflorescence* a simple subdense, cylindric-conical raceme; peduncle 400–500(–650) mm long, with sterile bracts; bracts ovate-acute, 13–16 × 5–7 mm, 5–many-nerved. *Flowers* scarlet-pink, 25–40 mm long, cylindric-trigonous; all segments free; pedicels 10–15(–20) mm long. *Anthers* exserted 1–4 mm. *Ovary* ± 5.0–7.0 × 2.5 mm, green; style exserted 5–10 mm. *Fruit* ± 18(–23) × 7(–9) mm, grey. *Flowering time* October to December.

34. **Aloe brevifolia** Mill., The abridgement of The gardener's dictionary: no. 8 (1771); DC.: t. 81 (1801); W.T.Aiton: 294 (1811); Haw.: 80 (1812); Lindl.: t. 996 (1826); Salm-Dyck: 16, t. 1 (1863); Baker: 310 (1896a); A.Berger: 185 (1908); Pole Evans: t. 604 (1936f); Reynolds: 183 (1950); Jepp: 13 (1969); Bornman & D.S.Hardy: 65 (1972); B.-E. van Wyk & G.F.Sm.: 240 (1996). Lecto-iconeotype: *Aloe africana caulescens foliis glaucis brevissimis, foliorum summitate interna et externa nonnihil*

spinosa C.Commelijn, Praeludia botanica: 73, t. 22 (1703), selected by Wijnands (1983).

A. perfoliata L. var. δ L.: 320 (1753); Willd.: 183 (1799). Iconotype: as above.

A. perfoliata L. var. ζ L.: 320 (1753); Willd.: 186 (1799). Iconotype: C.Commelijn, Praeludia botanica: 72, t. 21 (1703).

A. prolifera Haw.: 16 (1804); W.T.Aiton: 294 (1811); Schult. & Schult.f.: 686 (1829); Kunth: 519 (1843). Lecto-iconeotype: C.Commelijn, Praeludia botanica: 73, t. 22 (1703), selected by Wijnands (1983).

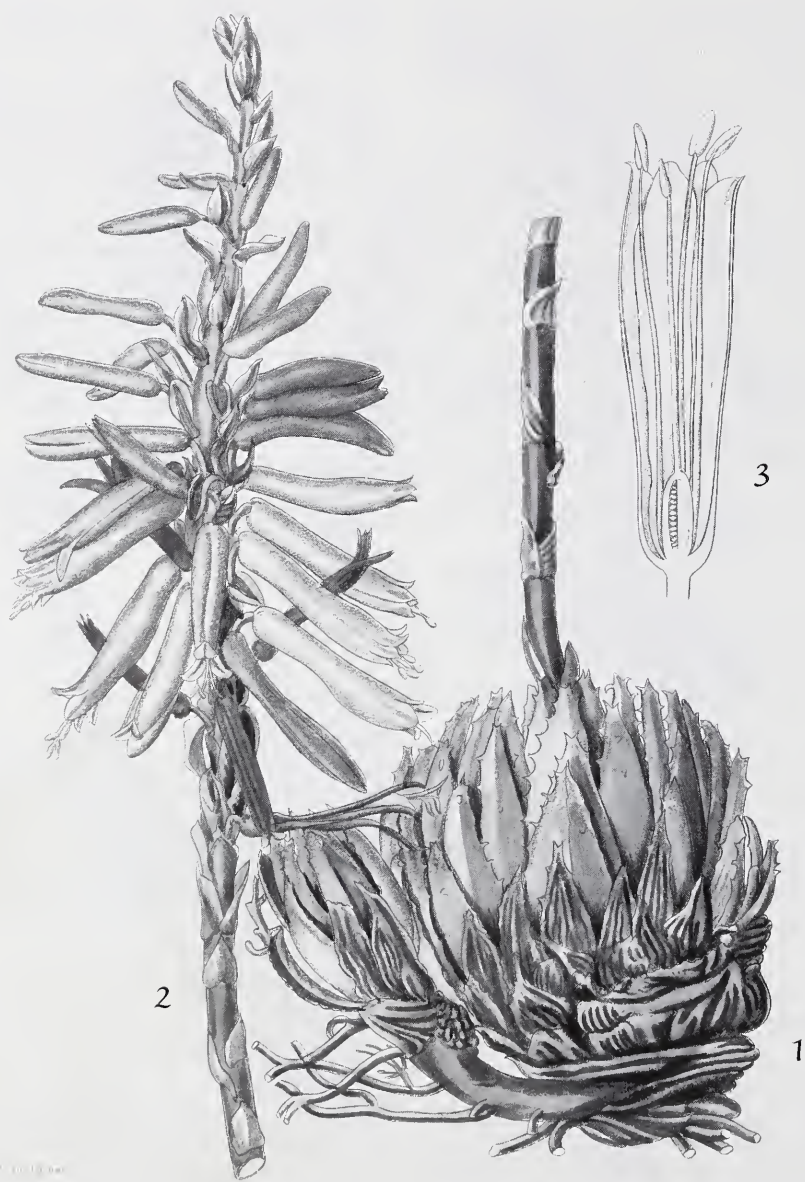


FIGURE 6.—Section Proliferae. *Aloe brevifolia*: 1, habit; 2, inflorescence; 3, median longitudinal section of flower $\times 1.5$. Taken from Pole Evans (1936f).

A. prolifera Haw. var. *major* Salm-Dyck: 23 (1817); Haw.: 44 (1819). Iconotype: C.Commelijn, *Praeludia botanica*: 73, t. 22 (1703).

A. postgenita Schult. & Schult.f.: 714 (1829); Kunth: 519 (1843). *A. brevifolia* Mill. var. *postgenita* (Schult. & Schult.f.) Baker: 160 (1880a); Baker: 310 (1896a); A.Berger: 185 (1908); Reynolds: 187 (1950); Jeppe: 13 (1969); Bornman & D.S.Hardy: 65 (1972). Type: none cited.

Description as for section. Figure 6.

Aloe brevifolia occurs on heavy clay in the winter-rainfall area of the Western Cape. The surrounding vegetation is fynbos.

The dense clumps of rosettes of small deltoid glaucous blue leaves with distinct teeth and cartilaginous surface prickles in median line distinguish this species from all others in southern Africa.

The epithet *brevifolia*, meaning 'short-leaved', is aptly descriptive of the typical variety of this species.

Two varieties are recognised:

- Leaves up to 100 mm long; plants usually suckering 34a. var. *brevifolia*
 Leaves longer than 100 mm; plants usually solitary 34b. var. *depressa*

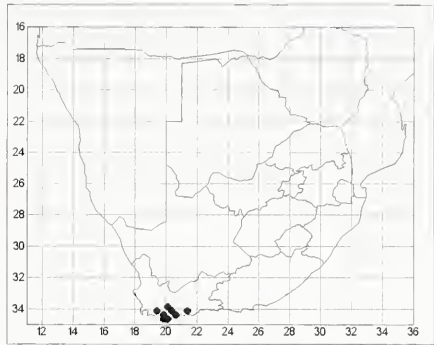
34a. var. *brevifolia*.

Description as for section.

Endemic to the Western Cape. Map 26.

Vouchers: *Lang 6810* (PRE); *Muir s.n.* (K); *Reynolds 3253* (PRE); *C.A. Smith 4951* (PRE).

34b. var. *depressa* (Haw.) Baker in Journal of the Linnean Society of London, Botany 18: 160 (1880a); Baker: 310 (1896a); A.Berger: 186 (1908); Reynolds: 188 (1950); Jeppe: 13 (1969); Bornman & D.S.Hardy: 65 (1972). Iconotype: *Aloe africana caulescens, foliis glaucis brevioribus caulem amplexantibus, foliorum parte interna et externa nonnihil spinosa* C.Commelijn, *Praeludia botanica*: 72, t. 21 (1703).



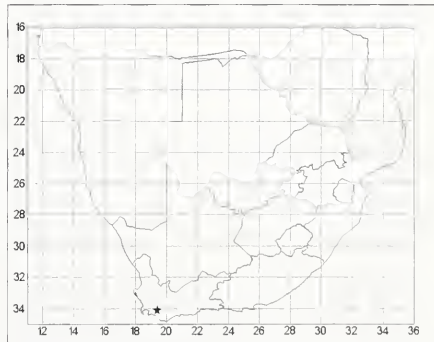
MAP 26.—*Aloe brevifolia* var. *brevifolia*

A. depressa Haw.: 16 (1804); W.T.Aiton: 294 (1811); Haw.: 80 (1812); Salm-Dyck: 16, t. 3 (1854).

A. serra DC.: t. 80 (1801); Haw.: 44 (1819); Baker: 310 (1896a). *A. brevifolia* Mill. var. *serra* (DC.) A.Berger: 186 (1908). Lecto-iconotype: C.Commelijn, *Praeludia botanica*: 72, t. 21 (1703).

Leaves 120–150 × up to 60 mm, sometimes spotted in upper half. *Peduncle* up to 650 mm long; pedicels up to 20 mm long. *Fruit* 20–23 × 7–9 mm, brown. *Seeds* ± 4.0 × 1.5 × 1.0 mm, charcoal-grey, not winged. Other characters as in var. *brevifolia*.

Endemic to the Western Cape. Map 27.



MAP 27.—*Aloe brevifolia* var. *depressa*

This variety is characterised by much larger leaves than the typical variety. Plants of this variety do not form clumps as readily, and so are more often found in the solitary state than the typical variety.

The meaning of the varietal epithet is 'flattened', apparently referring to the fact that the

leaves are relatively not as thick as those of var. *brevifolia*.

Vouchers: *Frames 13407* (PRE); *Pillans BOL18642* (BOL); *Reynolds 2043* (PRE).

7. Section *Rhodacanthae*

Section *Rhodacanthae* Salm-Dyck, Monographia generum Aloes et Mesembryanthemi: 17 (1837); A.Berger: 187 (1908). Type species: *A. glauca* Mill.

Series *Comosae* A.Berger: 281 (1908); Reynolds: 386 (1950). Type species: *A. comosa* Marloth & A.Berger.

Series *Rhodacanthae* (Salm-Dyck) Reynolds: 190 (1950).

Plants stemless or caulescent, solitary or in dense groups. *Leaves* rosulate, deltoid, lanceolate or tetrahedral, glaucous, lineate, margins dentate. *Inflorescence* usually a simple, initially subcapitate, later elongate raceme; peduncle with sterile bracts; buds congested, overtopped by bracts at apex of young raceme. *Perianth* segments usually free, not constricted at mouth. *Anthems* usually not or shortly exerted. *Style* usually not or shortly exerted.

1a Leaves up to 300 mm long, without longitudinal lines; plants stemless:

2a Leaves arranged in a distinctly 5-ranked spiral, without dorsal spines; inflorescence branched 36. *A. polyphylla*

2b Leaves not in a 5-ranked spiral, with dorsal spines; inflorescence simple 35. *A. pratensis*

1b Leaves 300 mm long or more, with obscure to distinct pale longitudinal lines; plants usually caulescent:

3a Stem short, shorter than 1 m, or absent; leaves \pm 3 times as long as wide; bracts ovate-deltoid 37. *A. glauca*

3b Stem (in adult plants) 1 m tall or taller; leaves \pm 4 times as long as wide:

4a Inflorescence up to 1.2 m tall; perianth segments free or almost so; bracts oblanceolate 38. *A. lineata*

4b Inflorescence taller than 1.5 m; perianth segments connate in basal third; bracts lanceolate-acuminate 39. *A. comosa*

Species included in this section have leaves which are more or less obscurely lineate and without spots. All except *A. polyphylla* have simple inflorescences; although *A. polyphylla* has a branched inflorescence, it is very similar to *A. pratensis* and *A. glauca* in the disposition and structure of the flowers. *A. comosa* is so similar in habit and leaf characters to *A. lineata* that it is placed in this section rather than on its own, as was done by Berger (1908).

35. *Aloe pratensis* Baker in Journal of the Linnean Society of London, Botany 18: 156 (1880a); Baker: t. 6705 (1883); Baker: 308 (1896a); A.Berger: 187 (1908); Pole Evans: t. 432 (1931b);

Reynolds: 191 (1950); Jeppe: 12 (1969); Bornman & D.S.Hardy: 67 (1972); B.-E. van Wyk & G.F.Sm.: 156 (1996). Type: Eastern Cape, Somerset Division, *MacOwan 1896* (K, holo.!, PRE, photo.!).

Plants stemless, 150–250 mm tall excluding inflorescence; usually in clumps. *Leaves* 30–40 per rosette, lanceolate to ovate-lanceolate, 100–170(–300) × 40–60 mm, upper surface flat to slightly channelled, sometimes with few prickles, lower surface convex with few prickles, sometimes obscurely keeled. *Inflorescence* a simple raceme; peduncle 400–600 mm long; bracts 35–65 × 8–18 mm, many-nerved. *Flowers* rose-red, cylindric-trigonous, 30–40 mm long; pedicels 25–40 mm long, lengthening to 50 mm in fruit. *Anthers* not or hardly exerted. *Ovary* 5.0–8.0 × 1.0–2.5 mm, green; style exerted 1–3 mm. *Fruit* 24–37 × 7–11 mm, grey. *Seeds* black, 4.5–5.0 × 3.0–4.0 × 0.5–1.0 mm, with a narrow wing. *Flowering time* August to December.

Aloe pratensis occurs among rocks in montane grassland in some of the coldest parts of the southern Drakensberg in KwaZulu-Natal and the Eastern Cape. Map 28.

The leaf teeth and prickles, which arise from white tubercular bases, set this species apart from others in this section. Unlike *A. polyphylla* (no. 36), plants of this species often form clumps, but like that species they are stemless. The peduncle is densely covered with sterile bracts, unlike most other southern African species of *Aloe*. A most unusual character of *A.*

pratensis is the raceme, which elongates significantly as flowering progresses although the length of the peduncle remains roughly constant, so that the portion of the raceme with unopened buds is capitate, but the portion with open flowers and developing fruits is conical.

The specific epithet is obscure because it indicates that this plant is to be found in meadows, whereas in fact it is found in rocky places, usually wedged between rocks. The seSotho common name is *lekhala qhalene* ('aloe that opens out'—Reynolds 1950).

Vouchers: *Galpin 119* (PRE); *Marais 940* (PRE); *Reynolds 1580* (PRE, SAM); *Trauseld 636* (NU, PRE); *J.M. Wood 4574* (K, NH).

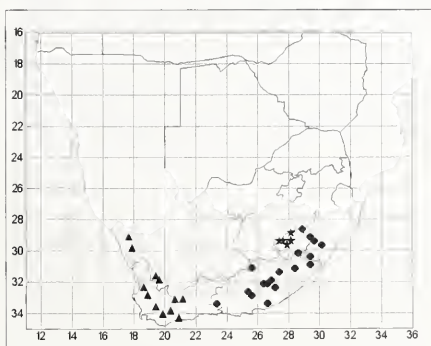
Hybrids:

1. *A. pratensis* × *A. maculata* (no. 45).
Vouchers: *Becker GRAA7281* (GRA); *Reynolds 140* (PRE).

2. *A. pratensis* × *A. arborescens* (no. 96).
Voucher: *Smith 771* (PRE).

36. ***Aloe polyphylla* Schönland ex Pillans** in South African Gardening and Country Life 24: 267 (1934a); Reynolds: 11 (1934); Pole Evans: t. 571 (1935b); Reynolds: 194 (1950); Jeppe: 11 (1969); Bornman & D.S.Hardy: 69 (1972); Talukdar: 985 (1983); B.-E. van Wyk & G.F.Sm.: 154 (1996). Type: Lesotho, near Maseru, *Reynolds 934* (= *BOL 21370*) (BOL!).

Plants stemless, 300–500 mm tall, rosettes 600–800 mm in diameter, solitary or in groups. *Leaves* ± 150 in a 5-ranked spiral, tetrahedral, 100–300 × 40–100 mm, emerald-green, margins cartilaginous, with white teeth. *Inflorescence* 500–600 mm tall, 3–8-branched; peduncles ± 250 mm long above branching point; bracts ovate-acuminate, ± 29 × 7 mm, ± 5-nerved. *Flowers* pale salmon-pink to pale red, 37–55 mm long; pedicels 30–60 mm long. *Anthers* exerted up to 5 mm. *Ovary* ± 9 × 3 mm; style exerted up to 5 mm. *Fruit* not seen. *Flowering time* September to October.



MAP 28.—● *Aloe pratensis*
★ *A. polyphylla*
▲ *A. glauca*

Almost endemic to Lesotho (with one record on the Free State border), *A. polyphylla* occurs on steep, well-drained rocks high in the Maluti Mountains, in areas of very high rainfall and winter snow. Map 28.

The numerous leaves in a compressed 5-ranked spiral and the cartilaginous keel with, rarely, one or two prickles distinguish this species from all others in the genus. Species of *Astroloba* have 5-ranked leaves, but in that genus the leaves are much smaller and less numerous, and the axis is much longer relative to the size of the leaves.

The name *polyphylla* is derived from two Greek words meaning 'many leaves'—plants of this species have large numbers of relatively small leaves. The seSotho common name of this species is *lekhala kharatsa* ('coiled aloe'—Reynolds 1950).

Vouchers: Ashton 248 (PRE); Jacot Guillarmod 2982 (PRE); Reynolds 2625 (PRE, SAM); Schmitz 6898 (PRE).

37. *Aloe glauca* Mill., The gardener's dictionary: no. 16 (1768); Willd.: 186 (1799); W.T.Aiton: 295 (1811); Haw.: 79 (1812); Haw.: 40 (1821); Salm-Dyck: 17, t. 2 (1863); Baker: 534 (1897); A.Berger: 188 (1908); Reynolds: 197 (1950); Jeppe: 51 (1969); Bornman & D.S.Hardy: 71 (1972); Glen & G.F.Sm.: 39 (1995); B.-E. van Wyk & G.F.Sm.: 136 (1996). Neotype: Western Cape, hills south of Wyke, Reynolds 1967 (PRE!).

A. perfoliata L. κ L.: 320 (1753). Iconotype: *Aloe africana foliis glaucis, margine & dorsi parte superiore spinosis, flore rubro* C.Commelijn, Praeludia botanica: 75, t. 24 (1703).

A. perfoliata L. ζ *glauca* (Mill.) Aiton: 466 (1789).

A. rhodacantha DC.: t. 44 (1800); Haw.: 27 (1804); Ker Gawl.: t. 1278 (1810a). Iconotype: DC., Historia plantarum succulentarum: t. 44 (1800).

A. muricata Schult.: 70 (1809). *A. glauca* Mill. var. *muricata* (Schult.) Baker: 161 (1880a); Baker: 534 (1897); A.Berger: 188 (1908); Reynolds: 201 (1950); Jeppe: 52 (1969); Bornman & D.S.Hardy: 71 (1972); Glen &

G.F.Sm.: 40 (1995). Neotype: Western Cape, Piketberg division, De Hoek, Reynolds 4749 (PRE, holo.!; SAM!).

A. glauca Mill. var. *major* Haw.: 79 (1812). Lecto-iconotype: C.Commelijn, Praeludia botanica: 75, t. 24 (1703).

A. glauca Mill. var. *minor* Haw.: 79 (1812). Lecto-iconotype: Curtis's Botanical Magazine 31: t. 1278 (1810).

A. glauca Mill. var. *elatior* Salm-Dyck: 24, 57 (1817). Based on *A. rhodacantha* DC.

A. glauca Mill. var. *humilior* Salm-Dyck: 24, 57 (1817). Based on *A. glauca* Mill.

A. glauca Mill. var. *spinosior* Haw.: 40 (1821). Type: not cited.

Plants usually solitary, short-stemmed, 300–600 mm tall excluding inflorescence. Leaves 30–40, lanceolate, 250–400 × 70–150 mm, upper surface flat to slightly channelled, lower surface convex, very glaucous with faint longitudinal lines. Inflorescence a simple raceme; peduncle 0.5–1.0 m long; bracts ovate-deltoid, acute, 27–40 × 8–15 mm, many-nerved. Flowers deep pink, cylindric, 28–40 mm long; pedicels 19–40 mm long. Anthers exserted 1–2 mm. Ovary 5–9 × 2–3 mm, green; style exserted up to 3 mm. Fruit not seen. Flowering time mainly August to October.

Aloe glauca is endemic to the Northern and Western Cape, where it usually occurs on clay soils in mountain renosterveld, but it is also known to occur in karoo vegetation around Laingsburg. Map 28.

In this species the stem is shorter than in *A. lineata* (no. 38) and is often prostrate. The leaves are glaucous, not glossy or yellow-green, and of solid colour or at most obscurely lined, not distinctly lined as in *A. lineata*. The racemes of *A. glauca* are cylindric with rounded apices, whereas those of *A. lineata* are conical with acute apices. *A. comosa* (no. 39) is a much taller plant with a very tall inflorescence of flowers in which the anthers and styles are more exserted than in *A. glauca*.

To understand the significance of the name (which means blue-green) of this species, it is necessary to trace it back beyond the start of the

binomial system which has been used since its invention by Linnaeus (1753). Pre-Linnaean plant names were descriptive phrases, often of some considerable length, indicating how each species could be distinguished from others of the same genus. When what were then called trivial names were first used in the second half of the eighteenth century, one key word from the phrase name in commonest use (one plant might have several) was normally used for the trivial name. The phrase name given to this species by Commelijn (1701) was *Aloe africana glauca margine et dorsi parte superiore spinosa* (with *flore rubro* added a few years later [Commelijn 1703]). The trivial name *africana* was used for *Aloe africana caulescens*, *foliis minus glaucis caulem amplectentibus dorsi parte suprema spinosa*. By coincidence, only one pre-Linnaean species of *Aloe* has *glauca* as its next keyword, and so the unique combination *A. glauca* was applied to this species.

Vouchers: *Acocks 19544* (PRE); *Henderson 1844* (NBG); *Meyer in Marloth 6562* (PRE, STE); *Reynolds 4749* (PRE, SAM); *Wurts 217* (NBG).

38. *Aloe lineata* (Aiton) Haw. in Transactions of the Linnean Society of London 7: 18 (1804); W.T.Aiton: 295 (1811); Haw.: 79 (1812); Haw.: 40 (1821); Salm-Dyck: 17, t. 1 (1863); Baker: 310 (1896a); A.Berger: 285 (1908); Pole Evans: t. 437 (1931c); Reynolds: 202 (1950); Jeppe: 53 (1969); Bornman & D.S.Hardy: 73 (1972); B.-E. van Wyk & G.F.Sm.: 54 (1996). Neotype: Eastern Cape, Oukraal near Uitenhage, *Reynolds 5728* (PRE, holo.!; SAM!), here designated.

A. perfoliata L. η *lineata* Aiton: 467 (1789).

A. lineata (Aiton) Haw. var. *viridis* Haw.: 40 (1821). Type: not cited.

A. lineata (Aiton) Haw. var. *glaucescens* Haw.: 40 (1821). Type: not cited.

Plants few-stemmed, stems up to 1.5 m tall in old specimens. Leaves 30–40 per rosette, lanceolate, 200–400 \times 40–90 mm, upper surface

flat to slightly channelled, lower surface convex, distinctly lineate, dull to bright green, margins sometimes brown and cartilaginous between teeth. Inflorescence a simple raceme up to 1.2 m tall; peduncle 0.75–1 m long; bracts oblanceolate, 20–27 \times 6–8 mm, many-nerved. Flowers salmon-pink to deep rose-pink, 32–50 mm long, cylindric-trigonous; all segments free or almost so; pedicels 20–40 mm long, lengthening in fruit. Anthers exerted 1–3 mm. Ovary 6–8 \times 2–3 mm, green; style exerted 4–8 mm. Fruit 20–27 \times 7.5–10.0 mm, buff. Figure 7.

Aloe lineata occurs typically in Eastern and Western Cape Succulent Veld (noorsveld), in areas of low rainfall which may occur at any season.

Differences between this species and *A. glauca* (no. 37) are discussed under that species. *A. comosa* (no. 39) seldom if ever has branched stems, and has much taller inflorescences in which the pedicels are sharply decurved. The anthers and styles of *A. comosa* are much further exerted than those of *A. lineata*.

The specific epithet refers to the longitudinal linear markings of the leaves.

Two varieties are recognised:

Flowering from February to March; leaves dull to bright green . . . 38a. var. *lineata*
Flowering from July to November; leaves yellowish or orange-green
. 38b. var. *muirii*

38a. var. ***lineata***.

Description as for species. Flowering time February to March.

Occurs in the Western and Eastern Cape. Map 29.

Vouchers: *H. Bolus 2688* (K); *Dyer 5328* (GRA, PRE); *MacOwan 3164* in *Herb. Austro-Afr: 1981* (BM, BOL, K, SAM, UPS); *Marloth 5723* (PRE); *Reynolds 3534* (PRE).

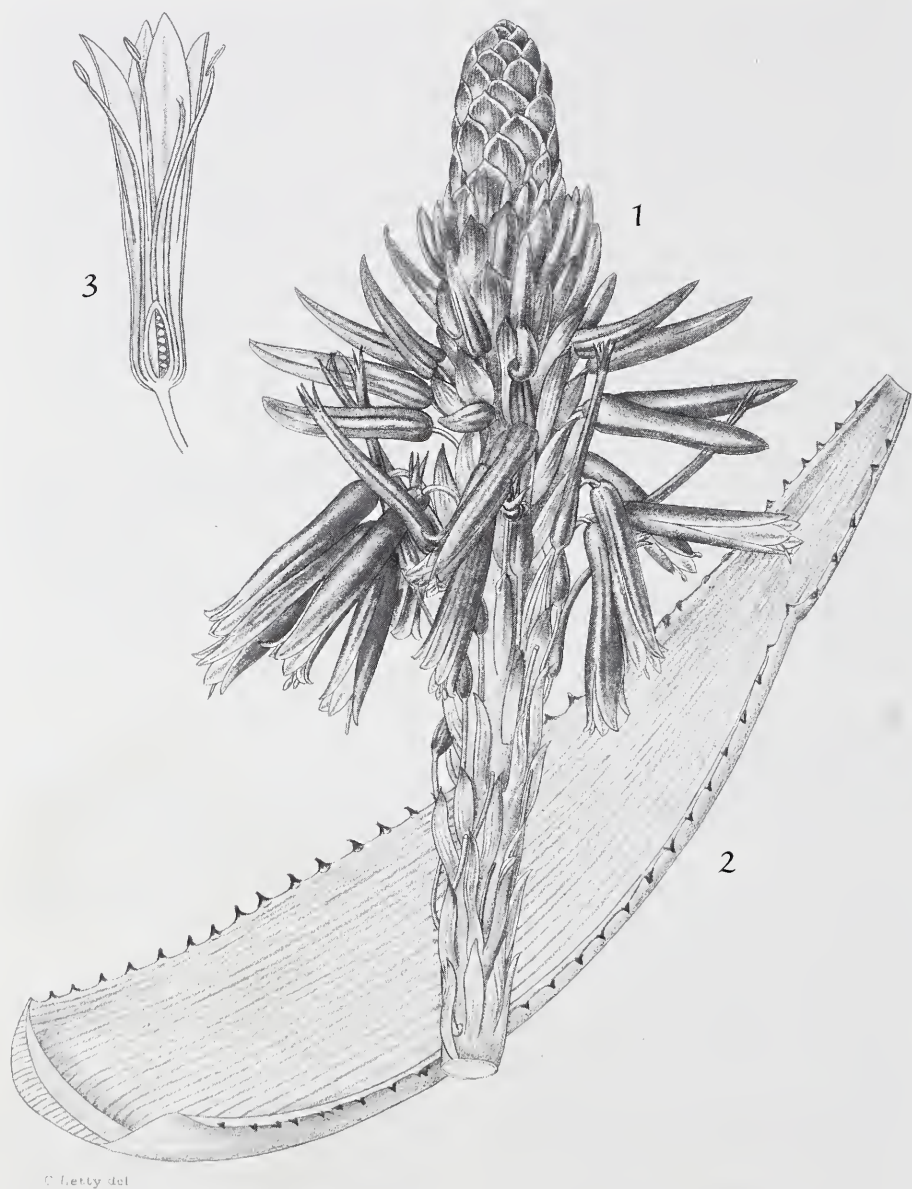
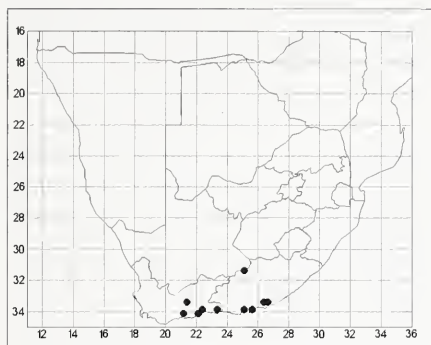


FIGURE 7.—Section *Rhodacanthae*. *Aloe lineata*: 1, inflorescence; 2, leaf; 3, median longitudinal section of flower. Taken from Pole Evans (1931c).

MAP 29.—*Aloe lineata* var. *lineata*

Hybrid:

A. lineata var. *lineata* × *A. arborescens* (no. 96) (*A.* × *platylepis* Baker, *A.* × *caesia* Salm-Dyck). Voucher: *Fourcade* 2231 (BOL).

38b. var. **muirii** (*Marloth*) *Reynolds*, The aloes of South Africa: 205 (1950); *Jeppe*: 53 (1969); *Bornman & D.S.Hardy*: 73 (1972). Type: Western Cape, Zandkraal, *Muir* 3267 (PRE!).

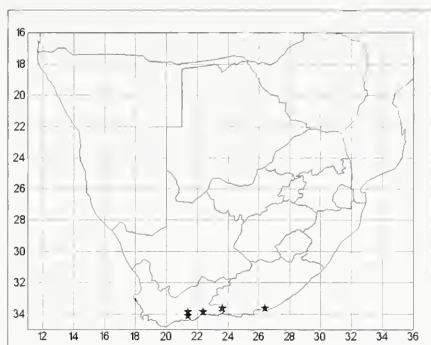
A. muirii *Marloth*: 210 (1929).

Leaves yellowish green to orange-green, much more distinctly lineate than those of var. *lineata*; marginal teeth slightly larger than in var. *lineata*. *Flowering time* July to November. Other characters as for var. *lineata*.

Occurs in the Western and Eastern Cape. Map 30.

This variety flowers in spring, unlike the typical variety, which flowers in autumn. Recognising this variety as distinct on the basis of this character is exactly analogous to the cases of *A. cooperi* subsp. *pulchra* (no. 21b)—where there are enough differences to allow the recognition of a subspecies—and *A. reitzii* var. *vernalis* (no. 107b).

Dr John Muir, after whom this variety is named, lived in Riversdale, in the southern part

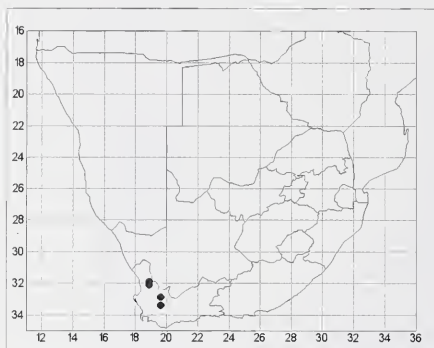
MAP 30.—*Aloe lineata* var. *muirii*

of the Western Cape for many years. He collected plants extensively in the area, and sent them to L. Bolus and N.E. Brown, who named many new species after him. He wrote what is still the standard work on the seeds washed up on South African shores by the Mozambique Current, and his collection of drift seeds is preserved at Stellenbosch University.

Vouchers: *Archibald* 6155 (PRE); *Hall* 858 (NBG); *Marloth* 13198 (PRE); *Reynolds* 3554 (BOL).

39. **Aloe comosa** *Marloth & A.Berger*, in *A.Berger* in *Botanische Jahrbücher* 38: 86 (1905b); *A.Berger*: 281 (1908); *Pole Evans*: t. 107 (1923a); *Reynolds*: 387 (1950); *Jeppe*: 55 (1969); *Bornman & D.S.Hardy*: 211 (1972); *Palmer & Pitman*: 373 (1972); *B.-E. van Wyk & G.F.Sm.*: 48 (1996). Type: Western Cape, between Clanwilliam and Vanrhynsdorp, *Marloth* 3787 (BOL, holo.!: GRA!, PRE!).

Plants solitary, arborescent, 1–2 m tall. *Leaves* many in a dense rosette, erect to spreading, 400–650 × 85–120 mm, apices sometimes recurved, shallowly channelled to D-shaped in section, glaucous to brownish pinkish grey above, bluish green below, margins pinkish. *Inflorescence* a simple, rarely shortly branched, dense raceme, usually 3–5 simultaneously, 1.5–2.5 m tall; bracts narrow-

MAP 31.—*Aloe comosa*

ly lanceolate-acuminate, 38–42 × 6–9 mm, 3–5-nerved. *Flowers* pinkish ivory, ventricose, 24–35 mm long; outer segments connate in basal third, inner segments free but dorsally adnate to outer in basal third; pedicels 13–20 mm long. *Anthers* exserted up to 10 mm. *Ovary* ± 6–9 × 2 mm, green; style exserted 10–12 mm. *Fruit* not seen. *Flowering time* December to January.

Endemic to the Western Cape. *A. comosa* occurs in pockets of soil among rocks on Table Mountain sandstone mountains, in areas of relatively low winter rainfall, in a transitional belt between fynbos and renosterbos. Map 31.

In habit (with erect stem and tall inflorescence) and flower colour, this species recalls *A. pretoriensis* (no. 66). That species, however, has branched inflorescences with cylindric, not ventricose, flowers and included, not exserted, anthers and styles. Differences between this species on the one hand and *A. glauca* (no. 37) and *A. lineata* (no. 38) on the other, are dealt with under those species.

An extension to the botanical meaning of the Latin word *comosus* to include ‘with a plume’ (from ‘with a tuft’, e.g. of sterile bracts, as in the inflorescence of *Eucomis*) appears to be the explanation of the name of this species. The tall, simple inflorescences presumably reminded Marloth and Berger of a plume or cockade.

Vouchers: *Pillans PSME5376* (GRA, K); *Pole Evans 243* (PRE); *Reynolds 4750* (BM, PRE, SAM); *Taylor 9047* (STE).

8. Section *Serrulatae*

Section *Serrulatae* *Salm-Dyck*, Monographia generum Aloes et Mesembryanthemi: 20 (1840). Type species: *A. variegata* L.

Subgenus *Gonialoe* Baker: 155 (1880a); Baker: 305 (1896a). Type species: not cited.

Series *Serrulatae* (*Salm-Dyck*) A. Berger: 88 (1908); Reynolds: 206 (1950).

Plants usually suckering, mostly in dense clumps, sometimes solitary, stemless. *Leaves* 3-ranked, deltoid to V-shaped in section, with horny margins and keel, margins minutely dentate; surfaces with pale or white spots in irregular transverse bands. *Inflorescence* a simple or branched, lax, cylindric to conical raceme; peduncles with sterile bracts; *Flowers* cylindric, slightly ventricose, sometimes with a distinct constriction above ovary; segments connate for over half their length. *Anthers* not or hardly exserted. *Style* not or hardly exserted.

- 1a Leaves spreading, held almost horizontally, longer than 200 mm; bracts 3-nerved 42. *A. dinteri*
- 1b Leaves ascending, held at an angle of at least 45° to the horizontal, shorter than 180 mm; bracts 1-nerved:
 - 2a Leaves ± 20–25; bracts longer than pedicels 40. *A. variegata*
 - 2b Leaves ± 6–8; bracts shorter than pedicels 41. *A. sladeniana*

The three species in this section are closely related, and share several characters that distinguish them from section 9, *Pictae*. Although plants in both sections have leaves with irregular transverse bands of spots, the leaves of plants in this section are three-ranked, while those in section *Pictae* are irregularly rosulate. Leaf margins in this section are cartilaginous and entire or minutely dentate, while plants in section *Pictae* have leaves without cartilaginous margins but which are coarsely dentate. Flowers of plants in this section lack the prominent basal swelling of the flower that characterises section *Pictae*.

40. **Aloe variegata** L., Species plantarum: 321 (1753); Mill.: no. 9 (1768); Lam.: 89 (1783); Aiton: 470 (1789); Thunb.: 61 (1794); Willd.: 190 (1799); DC.: 21 (1799); Sims: t. 513 (1801); W.T.Aiton: 296 (1811); Haw.: 81 (1812); Thunb.: 312 (1823); Salm-Dyck: 20, t. 2 (1840); Baker: 328 (1896a); A.Berger: 188 (1908); Marloth: 90 (1915); Pole Evans: t. 86 (1923b); Reynolds: 207 (1950); Jeppe: 16 (1969); Sölch, Roessler & Merxm.: 19 (1970); Bornman & D.S.Hardy: 75 (1972); Jankowitz: 54 (1975); B.-E. van Wyk & G.F.Sm.: 246 (1996). Iconotype: *Aloe africana humilis, foliis ex albo & viride variegatis* C.Commelijn, Horti medici Amstelaedamensis plantae rariorae et exoticae: 47, t. 47 (1706).

A. punctata Haw.: 26 (1804); Haw.: 44 (1821). Lectoiconotype: Pluk., Phytographia 129.1 (1691).

A. variegata L. var. *haworthii* A.Berger: 190 (1908). Type: Eastern Cape, Sheldon, *Schönland s.n.* (B).

A. ausana Dinter: 259 (1931). Syntypes: Namibia, Aus, Dinter 3149; Namibia, Klein Karas, Dinter 4762 (B, holo.; PRE!).

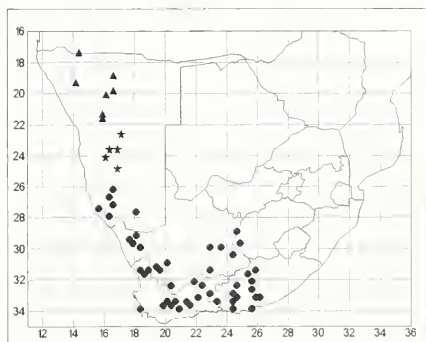
Plants 100–300 mm tall excluding inflorescence, in dense clumps. *Leaves* \pm 20–25, ascending, held at an angle of at least 45° to the horizontal, lanceolate-deltoid, 70–180 \times 30–80 mm, channelled to V-shaped in section, deep green to grey-green with white spots. *Inflorescence* usually simple, rarely 1- or 2-branched; peduncles 200–400 mm long; bracts narrowly deltoid, very thin, scarious, white, 8–15 \times 3–7 mm, 1-

nerved. *Flowers* flesh-pink to dull scarlet, 22–45 mm long; outer segments free for 5–7 mm, inner segments adnate to outer; pedicels 3–7 mm long, scarcely longer in fruit. *Anthers* exerted up to 2 mm. *Ovary* 5–7 \times 2–3 mm, green to reddish brown; style exerted up to 2 mm. *Fruit* \pm 27–30 \times 25 mm, blue-grey to buff. *Flowering time* July to September.

Aloe variegata occurs in Namibia, the Northern Cape, Free State and Western and Eastern Cape, on clayey soils, or rarely soils of decomposed granite, in karoo vegetation and on the edge of the Namib Desert. Plants usually grow in the protection of small bushes of *Pentzia* and similar genera. Map 32.

This species differs from *A. sladeniana* (no. 41) in having leaves with entire margins, and which are somewhat larger and more regularly three-ranked than those of *A. sladeniana*. The flowers of *A. sladeniana* are paler in colour than those of *A. variegata*. In *A. dinteri* (no. 42), the leaves are more nearly horizontal, much longer and more sharply folded.

Common names recorded for this species include *kanniedood* (Afrikaans) and partridge-breasted aloe (Reynolds 1950). The English common name, like the Latin specific epithet, refers to the spotted leaves. This species is used



MAP 32.—● *Aloe variegata*
★ *A. sladeniana*
▲ *A. dinteri*

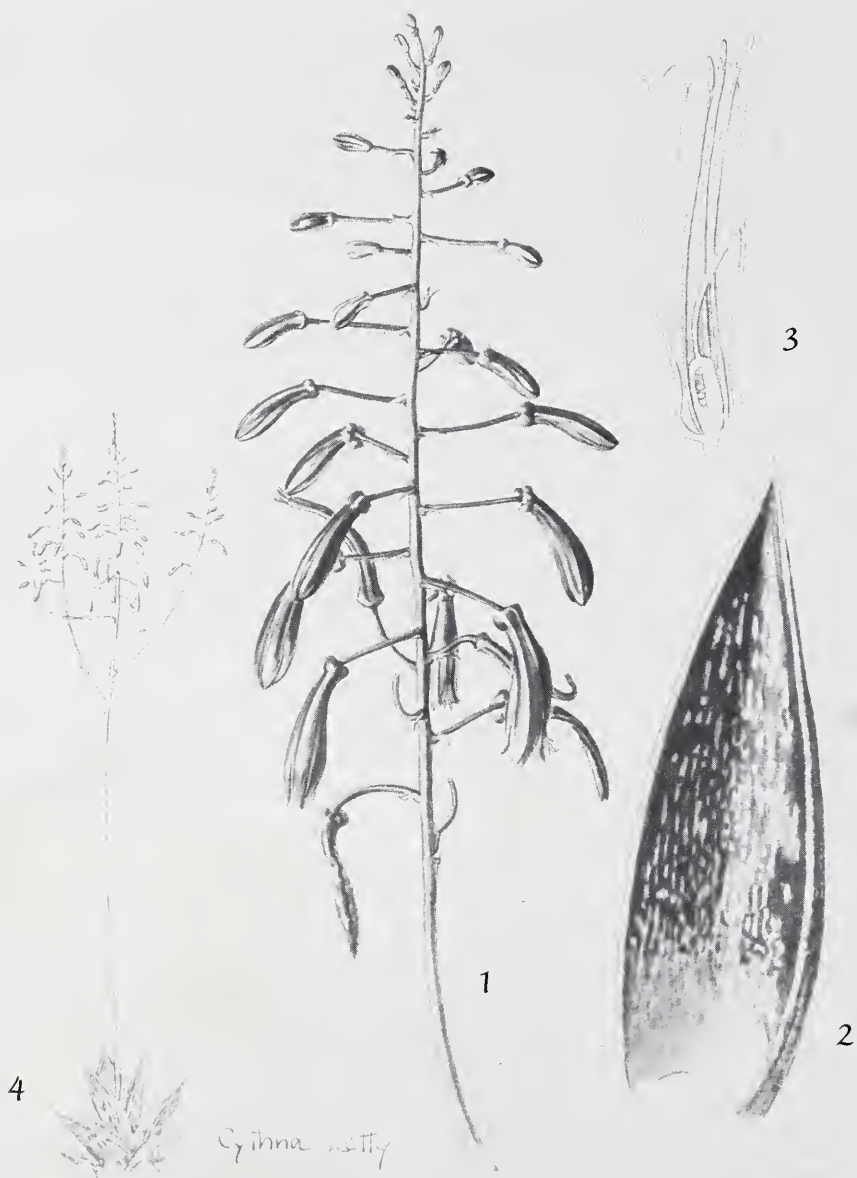


FIGURE 8.—Section Serrulatae. *Aloe sladeniana*: 1, inflorescence, $\times 0.8$; 2, leaf, $\times 0.8$; 3, longitudinal section of flower, $\times 2$; 4, habit, much reduced. Taken from Reynolds (1952).

in a Dutch remedy (*boereraat*) for toothache. In the North-West Province, a brandy infusion of cultivated plants of this species is used as *boereraat* for haemorrhoids (Watt & Breyer-Brandwijk 1963).

Vouchers: *Dinter* 4762 (PRE); *Dyer* 4015 (PRE, SAM, UPS); *Giess* 9456 (PRE); *Hardy* 2275 (PRE); *Plowes* 3218 (PRE).

Hybrid:

A. variegata × *A. hereroensis* var. *hereroensis* (no. 76a). Voucher: *Reynolds* 4602 (PRE).

41. *Aloe sladeniana* *Pole Evans* in *Annals of the Bolus Herbarium* 3: 13 (1920); *J.R. Brown*: 3 (1946); *Reynolds*: 212 (1950); *Reynolds*: t. 1122 (1952); *Jeppe*: 18 (1969); *Sölch, Roessler & Merxm.*: 18 (1970); *Bornman & D.S. Hardy*: 79 (1972); *Jankowitz*: 52 (1975). Type: Namibia, *Pearson PSME9000* (BOL!).

A. carowii *Reynolds*: 105 (1938b). Type: Namibia, *Nauchas, Reynolds* 2247 (PRE!).

Plants 75–150 mm tall excluding inflorescence, in dense clumps. *Leaves* ± 6–8, ascending, held at an angle of at least 45° to the horizontal, lanceolate-deltoid, 40–90 × 25–40 mm, channelled to V-shaped in section, deep green to grey-green with white spots. *Inflorescence* usually simple, rarely 1- or 2-branched; peduncles 200–500 mm long; bracts narrowly deltoid, very thin, scarious, white, 4–6 × 2–3 mm, 1-nerved. *Flowers* very pale to dull pink, 20–30 mm long; outer segments free for ± 7 mm, inner segments adnate to outer; pedicels 17–23 mm long. *Anthers* exerted up to 1 mm. *Ovary* 5.0–7.0 × 1.5–2.0 mm, green to reddish brown; style exerted up to 1 mm. *Fruit* not seen. *Flowering time* January to February. Figure 8.

Endemic to central Namibia. This species seems to replace *A. variegata* (no. 40) in the part of Namibia where winter rainfall gives way to rain (or drought) in all seasons. *A. sladeniana* in turn makes way for *A. dinteri* (no. 42) where summer rain predominates. Like the Namibian

populations of *A. variegata*, this species occurs on decomposed granites in areas with very cold winters. Map 32.

Differences between this species and *A. variegata* are discussed under that species. In addition, individual rosettes of *A. sladeniana* have far fewer leaves than rosettes of *A. variegata*. In *A. sladeniana* the leaf margins are finely notched, but in *A. dinteri* they are finely toothed. Other characters distinguishing these two species are the same as those distinguishing between *A. variegata* and *A. dinteri*.

Between 1908 and 1913, Professor H.H.W. Pearson organised five or six expeditions from Cape Town to Namaqualand, Namibia and Angola, with financial support from the Percy Sladen Memorial Fund. These expeditions were therefore known as Percy Sladen Memorial Expeditions, and about 80 papers were published as a result of them. At least two species, *Aloe sladeniana* and *Prenia sladeniana* (Mesembryanthemaceae), were discovered on these expeditions and named after the financial benefactor.

Vouchers: *Giess* 13663 (PRE); *Hall* NBG 480/55 (NBG); *Lewis* 229 (PRE); *Reynolds* 2247 (PRE).

42. *Aloe dinteri* *A. Berger*, in *Dinter, Neue und wenig bekannte Pflanzen Deutsch-Südwest-Afrikas*: 14 (1914); *Reynolds*: t. 637 (1936d); *Reynolds*: 210 (1950); *Jeppe*: 17 (1969); *Sölch, Roessler & Merxm.*: 16 (1970); *Bornman & D.S. Hardy*: 77 (1972); *Jankowitz*: 50 (1975). Type: Namibia, Outjo, *Dinter* 2791a (SAM!).

Plants solitary, 150–200 mm tall excluding inflorescence. *Leaves* 9–12, spreading, held almost horizontal, narrowly lanceolate to narrowly deltoid, 200–400 × 40–80 mm, V-shaped in section, deep grey-green or brownish green with white spots. *Inflorescence* 3–8-branched, 0.5–1.0 m high; bracts narrowly deltoid-acuminate, very thin, scarious, ± 7–12 × 2 mm, 3-nerved (1 distinct, 2 obscure). *Flowers* pale pink

with bluish bloom, 18–30 mm long, constricted above ovary; outer segments free for 5–10 mm, inner segments free but adnate to outer; pedicels 10–15 mm long, lengthening to 21 mm in fruit. *Anthers* not or hardly exerted. *Ovary* 5.0–6.0 × 1.5–2.5 mm, olive-green to brownish green; style not or hardly exerted. *Fruit* ± 26 × 12 mm, pale beige. *Flowering time* January to March.

Aloe dinteri occurs in Namibia in areas of low summer rainfall, usually wedged firmly in cracks in limestone rocks. Sometimes it also occurs on granite, in bushveld near the edge of the Namib Desert. Map 32.

In this species the roots form far more of the total mass of the plant than the stem, leaves and inflorescence. This disproportion is unique in the genus. Bracts of *A. dinteri* are 3-nerved, not 1-

nerved as in *A. variegata* (no. 40) and *A. sladeniana* (no. 41). Other differences between *A. dinteri* on the one hand and these two species on the other are discussed under the relevant species.

M.K. Dinter (1868–1945) spent four periods of several years in Namibia in the first four decades of the 20th century (Gunn & Codd 1981). He collected over 8 000 specimens, including the first records of many new species. Our knowledge of the flora of Namibia is still to a large extent based on Dinter specimens. A journal (*Dinteria*, published by the SWA Wissenschaftliches Gesellschaft) and several species, including *Aloe dinteri*, are named after him.

Vouchers: *Giess 15443* (MO, PRE, WIND), *Hall NBG255/51* (NBG); *Hardy 2093* (PRE); *Reynolds 1630* (PRE).

9. Section *Pictae*

Section *Pictae* *Salm-Dyck*, Monographia generum Aloes et Mesembryanthemi: 23 (1837). Type species: *A. maculata* All.

Section *Maculatae* Baker: 303 (1896a) pro parte, Type species: not cited.

Series *Saponariae* A.Berger: 47 (1905a); A.Berger: 192 (1908); Reynolds: 214 (1950). Type species: *A. saponaria* (Aiton) Haw.

Plants solitary or suckering to form large colonies; stemless or short-stemmed. *Leaves* spirally arranged, deltoid, lanceolate or apparently trapezoid by dying back of apices, slightly channelled, D-shaped or biconvex in section, surfaces with few to many pale spots, often in irregular transverse lines, sometimes confluent to cover almost the whole lower surface, margins sinuate-dentate with pungent teeth. *Inflorescence* a dichotomously branched and rebranched, rarely simple, dense to lax, capitate to cylindric raceme; sterile bracts present only on ultimate branches of peduncle. *Flowers* often with pale longitudinal stripes, inflated around ovary, constricted above it, expanding to cylindric-trigonus or rarely ventricose, decurved; segments connate for most of their length. *Anthers* not or shortly exerted. *Style* not or shortly exerted.

1a Plants in clumps:

2a Flower tube cylindric above basal constriction:

3a Leaves spotted on upper surface only:

4a Flower mouth straight; leaf spots irregularly arranged 57. *A. angolensis*

4b Flower mouth downturned; leaf spots in transverse bands 54. *A. parvibracteata*

3b Leaves spotted on both surfaces:

5a Bracts acuminate; flower mouth downturned; fruit ± 15 mm long 49. *A. greenii*

5b Bracts cirrhous; flower mouth straight; fruit ± 29 mm long 56. *A. zebrina*

2b Flower tube subclavate to clavate above basal constriction:

- 6a Racemes elongate, conical to cylindric:
 - 7a Racemes secund; flower tube subclavate 59. *A. monotropa*
 - 7b Racemes symmetrical; flower tube distinctly clavate 58. *A. grandidentata*
- 6b Racemes capitate, shortly conical:
 - 8a Inflorescence with over 30 racemes, these less than 80 mm in diameter 43. *A. branddraaiensis*
 - 8b Inflorescence with up to 15 racemes, these over 80 mm in diameter:
 - 9a Upper surface of leaves with spots and lines 44. *A. swynnertonii*
 - 9b Upper surface of leaves with spots but not lines 45. *A. maculata*
- 1b Plants solitary:
 - 10a Flower cylindric above basal constriction:
 - 11a Leaves up to 200 mm long, spotted on both surfaces; racemes very dense . . . 60. *A. prinslooii*
 - 11b Leaves longer than 400 mm, spotted on upper surface only; racemes sublux 57. *A. angolensis*
 - 10b Flower subclavate to ventricose above basal constriction:
 - 12a Raceme secund; flower mouth upturned 59. *A. monotropa*
 - 12b Raceme symmetrical; flower mouth straight to downturned:
 - 13a Leaf sap purple:
 - 14a Leaves spotted on upper surface only:
 - 15a Racemes longer than 190 mm, lax, elongate-conical 52. *A. fosteri*
 - 15b Racemes up to 175 mm long, dense, shortly conical 48. *A. mudenensis*
 - 14b Leaves spotted on both surfaces:
 - 16a Leaves up to 350 mm long; flowers orange to bright red 48. *A. mudenensis*
 - 16b Leaves longer than 500 mm; flowers greyish dark pink to brownish red 51. *A. pruinosa*
 - 13b Leaf sap yellow:
 - 17a Bracts as long as or longer than pedicels:
 - 18a Bracts up to 17 mm long; leaves with lower surface spotted, not lined . . . 50. *A. dyeri*
 - 18b Bracts over 17 mm long; leaves with lower surface lined:
 - 19a Plants up to 400 mm tall excluding inflorescence; inflorescence with \pm 15 racemes; bracts acuminate 55. *A. simii*
 - 19b Plants over 500 mm tall excluding inflorescence; inflorescence with \pm 30 racemes; bracts cirrhous 53. *A. dewetii*
 - 17b Bracts shorter than pedicels:
 - 20a Leaves less than 4 times as long as wide:
 - 21a Racemes up to 100 mm in diameter; seeds \pm 4 mm long, hardly winged 46. *A. greatheadii*
 - 21b Racemes over 120 mm in diameter; seeds \pm 6 mm long, broadly winged 45. *A. maculata*
 - 20b Leaves over 4 times as long as wide:
 - 22a Racemes conical, longer than wide; leaf spots obscure 47. *A. affinis*
 - 22b Racemes capitate, at least as wide as long; leaf spots distinct . . . 44. *A. swynnertonii*

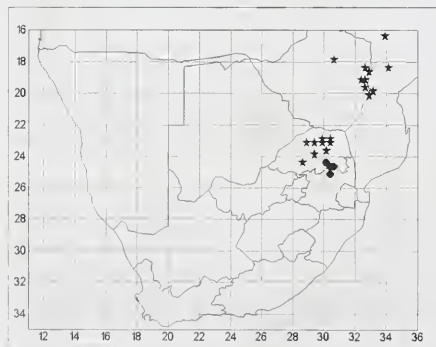
Plants of this section are very easily recognised as belonging to this group by the irregular transverse bands of spots on the leaves and the conspicuous basal swelling of the flower. Within this section, species are very difficult to recognise. Hybridisation and other probably continuing evolutionary processes make understanding this group a very difficult task. This difficulty is particularly acute in, for example, the circumscription of *A. greatheadii* (no. 46), *A. parvibracteata* (no. 54) and *A. zebrina* (no. 56). For this reason, no finality can be claimed for the treatment presented here.

43. *Aloe branddraaiensis* Groenew. ex Van der Merwe in The Flowering Plants of South Africa 20: t. 761 (1940); Reynolds: 219 (1950); Jeppe: 86 (1969); Bornman & D.S.Hardy: 83 (1972); B.-E. van Wyk & G.F.Sm.: 184 (1996). Type: Mpumalanga, Branddraai, F.Z. van der Merwe PRE24208 (PRE!).

Plants stemless, 200–300 mm tall excluding inflorescence, often suckering to form small clumps. *Leaves* 20–25, 250–500 × 60–100 mm, green, greyish or brownish, lineate, with many H-shaped spots irregularly scattered. *Inflorescence* with 40–80 ultimate branches, 1.0–1.5 m tall; racemes capitate; bracts deltoid-acuminate, 8–12 × 2.5–4.0 mm, 3–5-nerved. *Flowers* 15–27 mm long, dull scarlet-red with paler longitudinal stripes, subclavate to clavate above basal constriction; outer segments free for ± 7 mm, inner segments adnate to outer; pedicels 15–20 mm long, lengthening to ± 25 mm in fruit. *Anthers* not or hardly exerted. *Ovary* ± 3 × 2 mm; style not or hardly exerted. *Fruit* ± 16 × 8 mm, pale grey. *Flowering time* June to July.

Endemic to the Northern Province and Mpumalanga. *A. branddraaiensis* grows in bushveld on very thin soil close to the escarpment, at high altitude. Map 33.

The much-branched inflorescence distinguishes this species from all other maculatus.



MAP 33. —● *Aloe branddraaiensis*
★ *A. swynnertonii*

When not flowering, it may be distinguished from the geographically close *A. fosteri* (no. 52) by the disposition of the leaves, which are almost horizontal in this species but ascending to incurved in that one.

This species is named after the farm in Mpumalanga on which the type specimen was collected.

Vouchers: *Buitendag* 841 (NBG, PRE); *Reynolds* 2490 (PRE); *Strey* 3786 (PRE).

44. *Aloe swynnertonii* Rendle in Journal of the Linnean Society of London, Botany 40: 215 (1911); Reynolds: 15 (1954); Reynolds: 84 (1966); Jeppe: 84 (1969); Bornman & D.S.Hardy: 85 (1972); West: 45 (1974); B.-E. van Wyk & G.F.Sm.: 224 (1996). Type: Zimbabwe, near Chipetzana River, *Swynnerton* 722 (BM, holo.); K).

A. petrophila Pillans: 213 (1933a); Letty: t. 555 (1934b); Reynolds: 217 (1950); Jeppe: 85 (1969); Bornman & D.S.Hardy: 81 (1972). Type: Northern Province, Wyllies Poort, *Frames* BOL20482 (BOL!).

A. chinanimaniensis Christian: t. 639 (1936b); Reynolds: 220 (1950). Type: Zimbabwe, Chimanimani Mountains, *Christian* PRE21201 (PRE!).

A. vogtsii Reynolds: 118 (1936a); Reynolds: 257 (1950); Jeppe: 85 (1969); Bornman & D.S.Hardy: 119 (1972). Type: Northern Province, Soutpansberg, *Vogts* in *Reynolds* 1488 (PRE, holo.); BOL!).

A. melsetterensis Christian: t. 697 (1938a). Type: Zimbabwe, Chimanimani, *Christian* 275 (= PRE23026) (PRE!).

Plants 250–350 mm tall excluding inflorescence, solitary or suckering to form small groups, usually stemless. *Leaves* 15–20, spreading, 200–600 × 40–110 mm, shallowly channelled, dark green with irregular spots and lines above, pale green and striate below. *Inflorescence* with (5–)10–15 ultimate branches, 0.8–1.3 m tall; racemes capitate; bracts deltoid-acuminate, 6–16 × 2–3 mm, 5-nerved. *Flowers* 20–30 mm long, coral-red with slightly paler longitudinal stripes near mouth, subclavate above basal constriction; outer segments connate for ± half their length, inner segments adnate to outer;

pedicels 11–27 mm long. *Anthers* not exerted. *Ovary* 4.5–7.0 × 1.5–3.0 mm, green; style sometimes exerted up to 2 mm. *Fruit* ± 20 × 10 mm, bluish grey. *Flowering times* February to March and May to July.

Found in the Northern Province; also in Malawi, Mozambique and Zimbabwe. In the Soutpansberg this species occurs in cracks in the rock on cliff faces. Map 33.

The inflorescences have relatively few racemes, each of which is very capitate. The flowers are disposed in such a way as to give the appearance of a red sphere about the size of a tennis ball at the end of each peduncle when the first flowers open.

C.F.M. Swynnerton C.M.G. (1877–1938), a well-known early botanical explorer of Manicaland, farmed and collected extensively in the eastern highlands of Zimbabwe. Several species, including *Aloe swynnertonii*, are named after him (Gunn & Codd 1981).

Vouchers: *Hemm 119* (PRE, VENDA); *Jacobson 2402* (PRE); *Meeuse 10232* (LISC, PRE); *Reynolds 1873* (BOL, PRE); *Schlieben & Hardy 12097* (PRE).

Hybrid:

A. swynnertonii × *A. zebrina* (no. 56).
Voucher: *Buitendag 1144* (NBG).

45. *Aloe maculata* All., Auctarium ad synopsis methodicam stirpium horti regii Taurinensis: 13 (1773); All.: 65 (1774–1776); Medik.: 72 (1786); Dandy: 618 (1970); B.-E. van Wyk & G.F.Sm.: 206 (1996). Iconotype: *Aloe africana caulescens foliis spinosis maculatis ab utraque parte albicantibus notatis* J.Commelijn, Horti medici Amsteladaemensis 2: 9, t. 5 (1701).

A. perfoliata L. var. λ L.: 340 (1753). Iconotype: Dillenius, Hortus elthamensis 17, t. 14, fig. 15 (1732).

A. perfoliata L. var. θ L.: 340 (1753). Iconotype: C.Commelijn, Horti medici Amsteladaemensis plantae rariores et exoticae: 9, t. 5 (1706).

A. disticha Mill.: no. 5 (1768) non L. Iconotype: C.Commelijn, Horti medici Amsteladaemensis plantae rariores et exoticae: 9, t. 5 (1706).

A. maculosa Lam.: 87 (1783). Iconotype: Dillenius, Hortus elthamensis 17, t. 14, fig. 15 (1732).

A. perfoliata L. t. *saponaria* Aiton: 467 (1789). *A. saponaria* (Aiton) Haw.: 17 (1804); Haw.: 83 (1812); Ker Gawl.: t. 1460 (1812a); Haw.: 41 (1821); Baker: 312 (1896a); A.Berger: 201 (1908); Pole Evans: t. 96 (1923c); Reynolds: 224 (1950); Adamson: 171 (1950); Jeppe: 67 (1969); Bornman & D.S.Hardy: 89 (1972); West: 42 (1974); Compton: 101 (1976). No type cited.

A. umbellata DC.: t. 98 (1802); Salm-Dyck: 25, t. 1 (1863). Iconotype: DC., Historia plantarum succulentarum: t. 98 (1802).

A. saponaria (Aiton) Haw. var. *latifolia* Haw.: 18 (1804); Ker Gawl.: t. 1346 (1811a). *A. latifolia* (Haw.) Haw.: 82 (1812); Salm-Dyck: 23, t. 3 (1854); Baker: 313 (1896a); A.Berger: 204 (1908); Glen & G.F.Sm.: 40 (1995). Lecto-iconotype: Curtis's Botanical Magazine 33: t. 1346 (1811a).

A. leptophylla N.E.Br. ex Baker: 165 (1880a); Baker: 313 (1896a); Baker: t. 7624 (1898b); A.Berger: 198 (1908). Type: Western Cape, Worcester, *Cooper s.n.* (K!).

A. macracantha Baker: 167 (1880a); Baker: t. 6580 (1881); Baker: 314 (1896a); A.Berger: 199 (1908); Reynolds: 37 (1937a); Reynolds: 290 (1950). Type: Cape, no precise locality, *Cooper s.n.* (K!).

A. saponaria (Aiton) Haw. var. *bractyphylla* Baker: 164 (1880a); Baker: 313 (1896a); A.Berger: 202 (1908). Type: not cited.

A. leptophylla N.E.Br. ex Baker var. *stenophylla* Baker: 313 (1896a); A.Berger: 199 (1908). Type: not cited by Baker.

A. saponaria (Aiton) Haw. var. *ficksburgensis* Reynolds: 148 (1937b); Reynolds: 227 (1950); Jeppe: 68 (1969); Bornman & D.S.Hardy: 89 (1972). Type: Free State, Ficksburg, *Reynolds 2087* (PRE, holo.!; BOL!).

A. umfoloziensis Reynolds: 42 (1937a); Reynolds: 222 (1950); Jeppe: 69 (1969); Bornman & D.S.Hardy: 89 (1972); B.-E. van Wyk & G.F.Sm.: 226 (1996). Type: KwaZulu-Natal, Nongoma, *Reynolds 2011* (PRE!).

Plants stemless and suckering freely to short-stemmed and solitary, 200–500 mm tall excluding inflorescence. *Leaves* 12–20, spreading to slightly deflexed, narrowly to broadly lanceolate, 130–500 × 50–120 mm, upper surface flat to slightly channelled, dark green with many pale spots in irregular transverse rows, lower surface convex, paler green, lineate, with fewer

spots or unspotted. *Inflorescence* with (1–)4–12 ultimate branches, 0.4–1.5 m tall; racemes capitate; bracts deltoid-acuminate, 7–16 × 2.5–3.5 mm, distinctly 3-nerved to obscurely many-nerved. *Flowers* yellow to pink, orange or red, 20–45 mm long, subclavate to clavate above basal constriction; outer segments free for 6–15 mm, inner segments free but dorsally adnate to outer; pedicels 10–45 mm long, lengthening to 35–75 mm in fruit. *Antthers* exserted 1–5 mm. *Ovary* 5–10 × 2–4 mm, pale green; style exserted 3–5 mm. *Fruit* 18–40 × 6–15 mm, bluish grey. *Seeds* charcoal-grey, $\pm 6.0 \times 2.5 \times 1.5$ mm, broadly winged. *Flowering time* June to September.

Found in Mpumalanga, Swaziland, the Free State, KwaZulu-Natal, Lesotho and the Western and Eastern Cape; also in Zimbabwe. *A. maculata* usually occurs in grassland, where the grass may be so dense as almost to choke any forbs out, or sparse, with much bare soil between the tufts. The soil varies from consolidated beach dunes to clay and stones, at altitudes from sea level to high mountains. Map 34.

Aloe maculata differs from *A. branddraaiensis* (no. 43) and *A. swynnertonii* (no. 44) in having fewer racemes per inflorescence than either of these species. Flowers of *A. branddraaiensis* are a shade of pale pink not found in *A. maculata*, whereas those of *A. swynnertonii* are often bicoloured, an arrangement not found in *A.*

maculata. Flowers of *A. swynnertonii* are shiny, as if polished to a high gloss; the flowers of *A. maculata*, while not pruinose, are not as shiny. Characters separating *A. mudenensis* (no. 48) from *A. maculata* are discussed under that species.

The specific epithet (*maculata* = spotted) refers to the spots on the leaves. This species was the first of the maculates to be cultivated in Europe, and the spotted leaves are recorded in the phrase name given by Commelijn on the plate that is the iconotype (see above). Common names recorded for this species include soap aloe, *icena* (Zulu), *inocelwane* (Xhosa) and *lekhala la thaba* ('mountain aloe' in seSotho) (Reynolds 1950). The recorded medicinal uses of this species are many. The leaf tissue forms an analgesic poultice which is used for cuts and abrasions. Other recorded medicinal uses are as cures for enteritis in fowls, and for ringworm. It is also used in tanning and magic.

Vouchers: *Bohnen* 7421 (PRE, STE); *Compton* 28541 (NBG, PRE); *Moll* 1879 (PRE); *Reynolds* 5449 (PRE); *Strey* 7594 (NU, PRE, UDW).

Hybrids:

1. *A. maculata* × *A. pratensis* (no. 35). See *A. pratensis*.

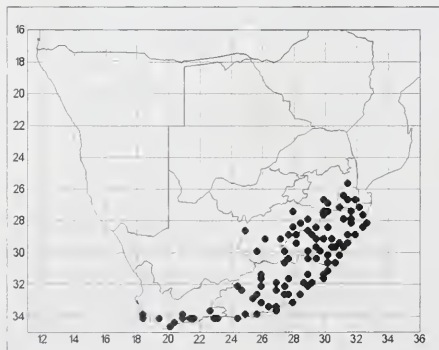
2. *A. maculata* × *A. mudenensis* (no. 48). Voucher: *Acocks s.n.* (PRE).

3. *A. maculata* × *A. grandidentata* (no. 58). Voucher: *Reynolds* 86 (BOL).

4. *A. maculata* × *A. striata* subsp. *striata* (no. 61a). (*A.* × *schonlandii* Baker). Vouchers: *Herre* SUG29 (BOL); *Marloth* 8940 (PRE); *Schönland* SAM22636 (SAM); *Thorne* SAM57637 (SAM).

5. *A. maculata* × *A. perfoliata* (no. 87). Voucher: *Henderson* 1623 (NBG).

6. *A. maculata* × *A. arborescens* (no. 96) (*A.* × *obscura* Mill.). Vouchers: *McLoughlin s.n.* (PRE); *L.L. Britten* 5154 (GRA).



MAP 34.—*Aloe maculata*

7. *A. maculata* × *A. ferox* (no. 110). Voucher: Reynolds 1413 (PRE).

46. ***Aloe greatheadii* Schönland** in Records of the Albany Museum 1: 121 (1904); A. Berger: 212 (1908); Reynolds: 231 (1950); Reynolds: 46 (1954); Reynolds: 82 (1966); Jeppe: 82 (1969); Bornman & D.S. Hardy: 95 (1972); West: 46 (1974); B.-E. van Wyk & G.F. Sm.: 196 (1996). Type: Botswana, near Serowe, Schönland 1616 (GRA, holo.!; PRE!).

A. pallidiflora A. Berger: 58 (1905a); A. Berger: t. 8122 (1907). Type: Hort. La Mortola, Anon. s.n. (B?).

A. termetophila De Wild.: 30 (1921). Type: Democratic Republic of the Congo, near Lubumbashi, Homble 655 (BR).

Plants usually stemless, sometimes short-stemmed in old, robust plants; 150–300 mm tall excluding inflorescence; usually solitary. *Leaves* ± 12 per rosette, 160–470 × 60–120 mm, upper surface channelled, dark green with many pale spots in irregular transverse bands, lower surface convex, pale green, lineate. *Inflorescence* with 3–8 ultimate branches, 1.0–1.75 m tall; racemes capitate to subcapitate, dense; bracts narrowly deltoid-acuminate, 10–20 × 2–4 mm, 3–many-nerved. *Flowers* dull flesh-pink to almost white, often with paler longitudinal stripes, 22–35 mm long, subclavate above basal constriction; outer segments free for 7–10 mm, inner segments adnate to outer; pedicels 12–25 mm long, lengthening to ± 30 mm in fruit. *Anthers* exerted 1–2 mm. *Ovary* 5.0–7.0 × 1.5–3.0 mm, green; style exerted 2–3 mm. *Fruit* 19–32 × 9–15 mm, pinkish grey. *Seeds* deep grey-maroon, ± 4.0 × 2.5 × 1.0 mm, wing small to absent. *Flowering time* usually May to July.

At the southern end of its range, *A. greatheadii* occurs on rocky outcrops in highveld grassland, but further north it appears to favour termitaria. Populations on deep turf soil are by no means uncommon.

This species is very similar to *A. zebrina* (no. 56) and *A. parvibracteata* (no. 54). It differs from both of these by the subdense to dense, conical to subcapitate terminal raceme. It dif-

fers from *A. parvibracteata* in that the leaf sap dries golden yellow, not (usually) purple, and from *A. zebrina* in that peak flowering time is winter (July) not autumn (March). These species intergrade in southern tropical Africa, and would repay detailed investigation.

This species is named after Dr J.B. Greathead, who was co-collector with Dr S. Schönland of the type specimen.

Two varieties are recognised:

Raceme apex rounded in silhouette;
pedicels shorter than 15 mm

. 46a. var. *greatheadii*

Raceme apex acute in silhouette; pedicels

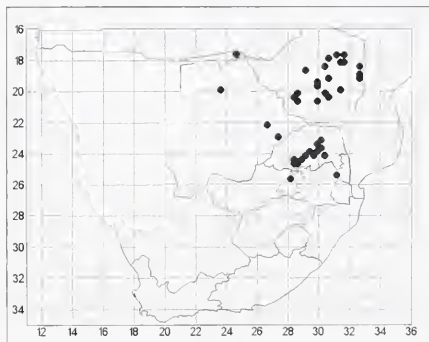
longer 15 mm 46b. var. *davyana*

Note: this key will not work with material of tropical African origin. However, only the variety *greatheadii* occurs north of the Limpopo River.

46a. var. *greatheadii*.

Description as for species.

Found in Botswana, the Northern Province, Gauteng and Mpumalanga; also in the Democratic Republic of the Congo, Malawi, Mozambique and Zimbabwe. Map 35.



MAP 35.—*Aloe greatheadii* var. *greatheadii*

Vouchers: *Galpin 13315* (PRE); *Marloth 5145* (PRE); *Reynolds 1519* (BOL, PRE); *Scheepers 992* (BM, MO, PRE, SRGH); *Smuts & Gillett 3561* (PRE).

Hybrids:

1. *A. greatheadii* var. *greatheadii* × *A. clavi-flora* (no. 70). Voucher: *Reynolds 1566* (PRE).

2. *A. greatheadii* var. *greatheadii* × *A. hereroensis* var. *hereroensis* (no. 76a). Vouchers: *Reynolds 1556* (PRE); *Wilman 13323* (PRE).

3. *A. greatheadii* var. *greatheadii* × *A. marlothii* subsp. *marlothii* (no. 104a). Vouchers: *Maguire 928* (NBG); *Reynolds 1523* (PRE).

4. *A. greatheadii* var. *greatheadii* × *A. littoralis* (no. 114). Voucher: *Pole Evans 11414* (PRE).

46b. var. *davyana* (Schönland) Glen & D.S.Hardy in South African Journal of Botany 53: 490 (1987a).

A. davyana Schönland: 288 (1905a); A.Berger: 211 (1908); Pole Evans: t. 358 (1929a); Reynolds: 233 (1950); Jeppe: 94 (1969); Bornman & D.S.Hardy: 97 (1972). Type: Gauteng?, no precise locality, *Burt Davy 1855* (GRA!).

A. longibracteata Pole Evans: 25 (1915); Pole Evans: t. 299 (1928b); Reynolds: 262 (1950); Jeppe: 92 (1969); Bornman & D.S.Hardy: 125 (1972); B.-E. van Wyk & G.F.Sm.: 204 (1996). Type: Mpumalanga, Lydenburg, *Pole Evans 56* (PRE!).

A. barbertoniae Pole Evans: 705 (1917); Reynolds: 265 (1950); Jeppe: 93 (1969); Bornman & D.S.Hardy: 127 (1972). Type: Mpumalanga, Barberton, *Thornicroft s.n.* (BOL!).

A. verdoorniae Reynolds: 173 (1936e); R.A.Dyer: t. 879 (1942); Reynolds: 237 (1950); Jeppe: 96 (1969); Bornman & D.S.Hardy: 99 (1972). Type: Gauteng, Trigaarts Poort, *Verdoorn 1624* (PRE!).

A. labiaflava Groenew.: 57 (1936e) Glen, G.F.Sm. & D.S.Hardy: 98 (1995). Neotype: Gauteng, Gembokspruit, *F.Z. van der Merwe 100* (PRE!).

A. comosibracteata Reynolds: 27 (1936f). Type: Mpumalanga, Barberton District, *Reynolds 1454* (PRE, holo.!; BOL!).

A. graciliflora Groenew.: 137 (1936f); Reynolds: 241 (1950); Jeppe: 94 (1969); Bornman & D.S.Hardy: 103

(1972); Glen, G.F.Sm. & D.S.Hardy: 98 (1995). Neotype: Mpumalanga, Dullstroom, *F.Z. van der Merwe PRE24089* (PRE!).

A. mutans Reynolds: t. 602 (1936g); Reynolds: 261 (1950); Jeppe: 91 (1969); Bornman & D.S.Hardy: 123 (1972). Type: Northern Province, near Chuniespoort, *Reynolds 1527* (PRE, holo.!; BOL!, SRGH!).

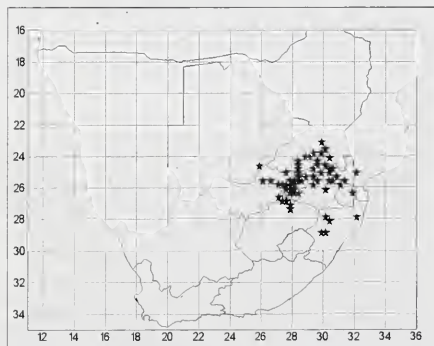
A. davyana Schönland var. *subulifera* Groenew.: t. 732 (1939); Reynolds: 235 (1950); Jeppe: 95 (1969); Bornman & D.S.Hardy: 97 (1972). Type: Northern Province, Pienaars River, *F.Z. van der Merwe PRE22816* (PRE!).

Plants more rarely short-stemmed, more often suckering. *Leaves* shorter, ± 80 –220 × 45–80 mm; upper surface flat to slightly convex. *Inflorescence* shorter, 0.6–1.2 m; racemes capitate to subcapitate. *Flowers* deeper pink. Other characters as for species.

Found in the Northern Province, North-West, Gauteng, Mpumalanga, Swaziland, Kwa-Zulu-Natal and Free State. Map 36.

This variety intergrades with var. *greatheadii* in the southern part of the Northern Province, and so cannot be held to be distinct at specific or subspecific level.

Dr J. Burt Davy, after whom this variety is named, founded the Botanical Research Institute, one of the predecessor organisations of the National Botanical Institute, in 1903. The seTswana name for this plant is *kgopane*



MAP 36.—*Aloe greatheadii* var. *davyana*

(Reynolds 1950). Large, concentrated populations of *A. greatheadii* var. *davyana* are an indication that the veld in which they occur is heavily overgrazed. *A. greatheadii* var. *davyana* is a splendid bee plant, particularly favoured by breeders of queen bees (Johannsmeyer pers. comm.). However, another report (Watt & Breyer-Brandwijk 1963) states that bees kept on an unrelieved diet of this species become very vicious. The honey is off-white and almost tasteless, with a slight hint of smokiness. In folk medicine, a decoction of this plant is used as a purgative in pregnancy, and the leaf pulp is used as a treatment for snakebite.

Vouchers: *Balsinhas* 3018 (MO, PRE); *Buitendag* 846 (PRE); *Edwards* 1096 (PRE); *Reynolds* 3895 (BM, PRE); *Verdoorn* 1625 (PRE).

Hybrids:

1. *A. greatheadii* var. *davyana* × *A. parvibracteata* (no. 54). Voucher: *Barnard* 533 (PRE).

2. *A. greatheadii* var. *davyana* × *A. cryptopoda* (no. 77). Vouchers: *Nicholson* 307 (PRE); *Reynolds* 1254 (PRE).

3. *A. greatheadii* var. *davyana* × *A. spicata* (no. 100). Vouchers: *Northover B* (PRE); *Reynolds* 1445 (BOL).

4. *A. greatheadii* var. *davyana* × *A. castanea* (no. 102). Voucher: *Vogts* 309 (PRE).

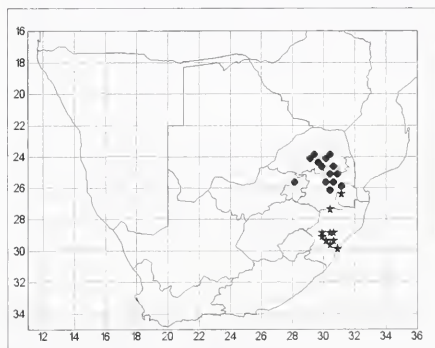
5. *A. greatheadii* var. *davyana* × *A. petricola* (no. 106). Voucher: *Reynolds* 1840 (PRE).

47. ***Aloe affinis*** A.Berger in Das Pflanzenreich 33: 206 (1908); Pole Evans: t. 759 (1939a); Reynolds: 243 (1950); Jeppe: 80 (1969); Bornman & D.S.Hardy: 105 (1972); Compton: 97 (1976); B.-E. van Wyk & G.F.Sm.: 182 (1996). Type: Mpumalanga, near Lydenburg, *Wilms* 1490 (B).

A. immaculata Pillans: 25 (1934b); Reynolds: 239 (1950); Jeppe: 81 (1969); Bornman & D.S.Hardy: 101 (1972); B.-E. van Wyk & G.F.Sm.: 200 (1996). Type: Northern Province, Malips Drift, *Herre* SUG6774 (BOL, holo.).

Plants solitary, stemless, 200–300 mm tall excluding inflorescence. *Leaves* 16–20, 200–400 × 50–100 mm, ascending, D-shaped to slightly channelled in section, green, lineate, with no to few spots on upper surface only, usually with maroon horny margins between teeth. *Inflorescence* with 3–8 ultimate branches; racemes subcylindric, dense; bracts deltoid-acuminate, ± 13–23 × 3 mm, ± 5-nerved. *Flowers* dull brick-red, sometimes clavate above constriction above ovary, 25–45 mm long; outer segments free for 6–10 mm, inner segments adnate to outer; pedicels 15–22 mm long, lengthening to 25–30 mm in fruit. *Anthers* not or hardly exerted. *Ovary* 7–9 × 2–3 mm, green; style exerted 0–4 mm. *Fruit* ± 17 × 8 mm, bluish grey. *Flowering time* May to June.

Aloe affinis has been recorded in the Northern Province, Gauteng and Mpumalanga, and occurs on sandy loam in bushveld. Plants of this species normally have leaves without spots or with only very few, irregularly arranged spots, and chocolate-brown horny margins. However, one finds plants with unspotted leaves in the same population as plants with quite densely spotted leaves, and plants with continuous, broken and absent brown margins all in one population. The absent to obscure leaf spots, brown horny margins and flowers with pronounced basal swellings distinguish typical plants of this species from all other species. Map 37.



MAP 37.—● *Aloe affinis*
★ *A. mudenensis*

Berger (1908) considered that this species was related (*affinis*, in Latin) to *A. zebrina*. This is undoubtedly true, but the relationship is no closer than that between this species and any other maculate.

Vouchers: *Compton 29121* (NBG, PRE, SRGH); *Jacobsen 2873* (PRE); *Kluge 1944* (PRE); *Reynolds 2517* (BOL, PRE); *J. Smuts 308* (PRE).

48. ***Aloe mudenensis*** Reynolds in Journal of South African Botany 3: 39 (1937a); Reynolds: 244 (1950); Jeppe: 70 (1969); Bornman & D.S.Hardy: 107 (1972); B.-E. van Wyk & G.F.Sm.: 210 (1996). Type: KwaZulu-Natal, Mudén Valley, *Reynolds 2029* (PRE, holo.; BOL!).

Plants usually solitary, short-stemmed, 250–500 mm tall excluding inflorescence. *Leaves* \pm 20, spreading, 175–350 \times 50–90 mm, blue-green in summer, blue-purple in winter, upper surface flat to slightly channelled, with many irregular pale spots, lower surface convex, leaete, with or without irregular spots. *Inflorescence* with \pm 8 ultimate branches, up to 1 m tall; racemes cylindric-conical, dense, up to 175 mm long; bracts deltoid-acuminate, 14–20 \times 2–4 mm, 5–9-nerved; pedicels 15–30 mm long, lengthening in fruit. *Flowers* 19–35 mm long, brilliant orange or sometimes varying from yellow to red, subclavate above basal constriction; outer segments free for 5–9 mm, inner segments adnate to outer. *Anthels* exerted 1–4 mm. *Ovary* 7–8 \times 2–3 mm; style exerted 2–5 mm. *Fruit* \pm 16 \times 8 mm. *Flowering time* June to July.

Found in Swaziland and KwaZulu-Natal, with one record on the Mpumalanga border. *A. mudenensis* occurs in valley bushveld on sandy loam. It is one of the few species to survive close to human habitation and in heavily overgrazed areas. Map 37.

Plants of this species are more often caulescent than any other member of this section except *A. angolensis* (no. 57). One very old plant was seen near Mudén with a prostrate

stem 2 m long. Other distinguishing characters are the bluish green leaves, which go an attractive shade of lilac in cold weather, and the striate lower surfaces of the leaves.

This species is named after its type locality, the Mudén valley of KwaZulu-Natal.

Vouchers: *Acocks 10527* (NH, PRE); *Compton 26972* (NBG, PRE); *Edwards 2843* (NU, PRE); *Reynolds 2030* (PRE); *Rogers 24589* (K).

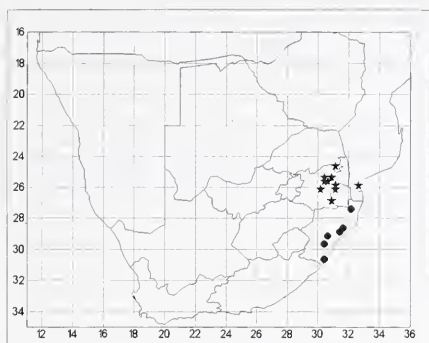
Hybrid:

A. mudenensis \times *A. maculata* (no. 45). See *A. maculata*.

49. ***Aloe greenii*** Baker in Journal of the Linnean Society of London, Botany 18: 165 (1880a); Baker: t. 6520 (1880b); Baker: 315 (1896a); A.Berger: 210 (1908); Reynolds: 246 (1950); Jeppe: 74 (1969); Bornman & D.S.Hardy: 109 (1972); B.-E. van Wyk & G.F.Sm.: 198 (1996). Type: Eastern Cape, no precise locality, *Anon. s.n.* (K!).

Plants stemless, 150–250 mm tall excluding inflorescence, forming large dense groups. *Leaves* 12–16 per rosette, 250–550 \times 40–80 mm, upper surface flat to slightly channelled, bright green with obscure lines and many whitish spots subconfluent in irregular transverse bands, lower surface convex, bands of spots broader and more pronounced than upper. *Inflorescence* with 5–7 ultimate branches, 1.0–1.3 m tall; racemes subcylindric, sublux; bracts deltoid-acuminate, 6–20 \times 2–3 mm, 7–many-nerved. *Flowers* dull flesh-pink with dusty bloom, 21–30 mm long; outer segments free for 7–10 mm, inner segments adnate to outer; pedicels 7–10 mm long. *Anthels* exerted up to 2 mm. *Ovary* \pm 6 \times 2 mm; style exerted 2–4 mm. *Fruit* \pm 15 \times 7 mm. *Flowering time* January to March.

This species occurs on stony soil in KwaZulu-Natal, often in deep shade in dry thorny woodland. In view of the fact that no definite



MAP 38.—● *Aloe greenii*
★ *A. dyeri*

records are known for the Eastern Cape, the type locality as stated in the protologue seems doubtful. Map 38.

Aloe greenii is similar to *A. pruinosa* (no. 51), but is smaller in all its parts, lacks the grey bloom on the inflorescence of that species, and suckers to form large groups, whereas *A. pruinosa* remains solitary. *A. greenii* is superficially similar to *A. parvibracteata* (no. 54), but several characters separate these two species. In *A. greenii*, the leaves are longer and narrower than in *A. parvibracteata*, the sap dries yellow, not purple, and in dense populations the leaves of individual heads are incurved, not recurved. In *A. greenii* the lower surface of the leaves is densely spotted, whereas in *A. parvibracteata* it is paler green than the upper surface, unspotted and striate.

There appears to be no record of the eponymous Mr Green. Baker (1880b) records that the type plant was received by Kew from Mr Wilson Saunders, who received it from Mr T. Cooper (see *A. cooperi*, no. 21), but it was not among the plants collected by the latter from the Eastern Cape.

Vouchers: *Doidge 64* (PRE); *Edwards 3285* (NU, PRE); *Lawn 1869* (NH); *Leach 34* (K, SRGH); *MacOwan 3153* in *Herb. Austro-Afr.* 1979 (K).

50. *Aloe dyeri* Schönland in Records of the Albany Museum 1: 289 (1905a); A. Berger: 209 (1908); Reynolds: 248 (1950); Jeppe: 76 (1969); Bornman & D.S. Hardy: 111 (1972); Compton: 99 (1976); B.-E. van Wyk & G.F. Sm.: 190 (1996). Type: Mpumalanga, no precise locality, *Burt Davy s.n.* (GRA!).

Plants usually solitary, stemless or short-stemmed, 400–700 mm tall excluding inflorescence. Leaves ± 20 , ascending or arcuate-reflexed, 400–700 \times 45–150 mm, channelled, upper surface usually with few to many small whitish spots, irregular or in wavy transverse bands, lower surface more copiously and usually more regularly spotted than upper. Inflorescence with 15–50 ultimate branches, 1.5–2.0 m tall; racemes cylindric, lax; bracts deltoid-acuminate, 10–17 \times 2–4 mm, many-nerved. Flowers glossy brick-red, 25–35 mm long, subclavate above basal constriction; outer segments free for 5–8 mm, inner segments free but adnate to outer; pedicels 7–17 mm long. Anthers not or hardly exserted. Ovary 5–8 \times 2–3 mm, green; style exserted 1–4 mm. Fruit not seen. Flowering time March to June.

Aloe dyeri is found in the southeast of the Northern Province, in Mpumalanga and Swaziland; also in Mozambique. It occurs in shade in thorny forest in stony kloofs at low altitude on the Mpumalanga and Swaziland escarpment, in similar positions on the Lebombo Mountains, or in stony grassland protected from the midday and afternoon sun. In its preference for protected places it differs from most members of this section. Map 38.

This is the largest species in the section, with rosettes reaching 2 m in diameter and inflorescences up to 2 m tall. The leaves are often arcuate-reflexed, a character not common in this section.

This species is named after Sir W.T. Thiselton-Dyer, editor of the last four volumes of *Flora capensis*. Thiselton-Dyer sent the type plant from Kew to Grahamstown, where it was described by Dr S. Schönland.

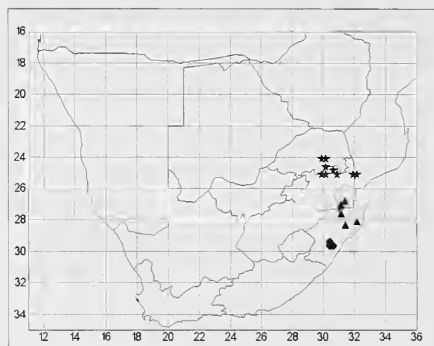
Vouchers: *Compton* 28887 (NBG, PRE); *Leach* 84 (K, PRE, SRGH); *Reynolds* 5553 (PRE, SRGH); *Van der Schijff* 3632 (PRE, SRGH).

51. *Aloe pruinosa* Reynolds in Journal of South African Botany 2: 122 (1936a); Reynolds: 250 (1950); Jeppe: 75 (1969); Bornman & D.S.Hardy: 113 (1972); B.-E. van Wyk & G.F.Sm.: 218 (1996). Type: KwaZulu-Natal, Pietermaritzburg, *Reynolds* 377 (PRE, holo.!, BOL!).

Plants solitary, 250–600 mm tall excluding inflorescence, with a 300–500 mm long, often prostrate stem. *Leaves* 16–24, erect to spreading, 500–750 × 60–100 mm, channelled, upper surface with many whitish spots, irregularly arranged or in transverse bands, lower surface with more numerous spots in more distinct bands. *Inflorescence* with 11–20 ultimate branches, 1.4–2.0 m tall; racemes conical, sub-lax; bracts deltoid-acuminate, 5–12 × 2–3 mm, 5–7-nerved. *Flowers* brownish red to darkish pink with greyish powdery bloom, 24–33 mm long, subclavate above basal constriction; outer segments free for 5–7 mm, inner segments adnate to outer; pedicels 8–12 mm long. *Anthers* exserted up to 2 mm. *Ovary* 6.0–8.0 × 1.5–3.0 mm, green; style exserted 1–4 mm. *Fruit* not seen. *Flowering time* February to March.

Aloe pruinosa is endemic to shade in *Acacia* woodland in the KwaZulu-Natal midlands. It occurs on heavy loam in areas of fairly high summer rainfall. Map 39.

This plant is smaller than *A. dyeri* (no. 50) but larger than other members of the section. *A. pruinosa* is more readily short-stemmed than that species, and there are differences in leaf markings and in the size and colour of the flowers. *A. pruinosa* differs from all other southern African *Aloe* species in having a copious dull grey bloom on the flowers, pedicels and peduncle. Although similar in many respects to *A. greenii* (no. 49), it is distinguishable from that species in the field in all seasons; the differences are given under *A. greenii*.



MAP 39.—● *Aloe pruinosa*
★ *A. fosteri*
▲ *A. dewettii*

In classical Latin the word *pruinus* means 'frosty'; in botanical Latin this meaning is extended by analogy to include 'covered with grey wax'. In this species the epithet refers to the grey bloom on the flowers.

Vouchers: *Comins* 374 (NU); *Giddy in Brandham & Cutler* 404 (K); *B. Nicholson* PRE 38115 (PRE).

52. *Aloe fosteri* Pillans in South African Gardening and Country Life 23: 140 (1933b); Pole Evans: t. 612 (1936g); Reynolds: 252 (1950); Jeppe: 89 (1969); Bornman & D.S.Hardy: 115 (1972); B.-E. van Wyk & G.F.Sm.: 192 (1996). Type: Mpumalanga, Lydenburg District, *Pillans* BOL 20447 (BOL!).

Plants solitary, 250–400 mm tall excluding inflorescence, usually stemless. *Leaves* 16–24, suberect, 300–400 × 40–80 mm, upper surface flat to slightly channelled, dark green with many pale green spots in irregular transverse bands, lower surface convex, paler green, unspotted. *Inflorescence* with 15–40 ultimate branches, 1.0–1.5 m tall; racemes cylindric, lax, longer than 190 mm; bracts deltoid-acuminate, 10–15 × 2–4 mm, many-nerved. *Flowers* yellow to red, 21–38 mm long, subclavate above basal constriction; outer segments free for 5–9 mm, inner segments mostly adnate to outer; pedicels 8–12

mm long. *Anthers* exerted up to 2 mm. *Ovary* 5–6 × 2–3 mm, green; style exerted up to 2 mm. *Fruit* 17–26 × 8–13 mm, pale brownish grey. *Flowering time* March to April.

Aloe fosteri occurs in thorny woodland on thin, rocky soils near the Northern Province and Mpumalanga escarpment, on the plateau side; there are also two records from the Lebombo Mountains, one on each side of the Mozambique/South Africa border. Map 39.

Differences between this species and *A. branddraaiensis* (no. 43) are dealt with under that species. The fine, grey, pruinose, waxy covering of the leaves, which can be rubbed off with a cloth, is unique to this species. The flowers vary from lemon-yellow to deep crimson and even to pale pink. It is the most variable of the maculates in this character.

The specific epithet honours Mr C. Foster, late of Krugersdorp, who collected the type specimen. The Bakone (Lebowa) name of this species is *tookgo* (Reynolds 1950). In Sekhukhuneland the heated leaves of this species are applied as poultices to sores.

Vouchers: *Buitendag* 842 (NBG, PRE); *Leach* 81 (K, SRGH); *Reynolds* 1321 (PRE); *Smuts* 1558 (PRE); *Van der Schijff* 2602 (PRE).

53. *Aloe dewetii* Reynolds in *Journal of South African Botany* 3: 139 (1937c); Reynolds: t. 692 (1938c); Reynolds: 266 (1950); Jeppe: 77 (1969); Bornman & D.S.Hardy: 129 (1972); Compton: 99 (1976); B.-E. van Wyk & G.F.Sm.: 188 (1996). Type: KwaZulu-Natal, Mkuzi Valley, Reynolds 2319 (PRE, holo.!; BOL!).

Plants solitary, stemless, 500–800 mm tall excluding inflorescence. *Leaves* ± 20, suberect to spreading, 360–500 × 70–130 mm, slightly channelled, often narrowing slightly near base, upper surface with many whitish spots irregularly arranged or in wavy transverse bands, lower surface without spots, with obscure lines. *Inflorescence* with 20–40 ultimate branches, up

to 2 m tall; racemes cylindric, lax; bracts deltoid-cirrhous, often rolled or twisted, 17–25 × 2.5–4.0 mm, 7–many-nerved. *Flowers* dull greyish red with bloom, 31–42 mm long, subclavate above basal constriction; outer segments free for 4–6 mm, inner segments dorsally adnate to outer; pedicels 8–15 mm long, lengthening slightly in fruit. *Anthers* exerted up to 3 mm. *Ovary* 5.0–10.0 × 2.5–4.0 mm, green; style exerted up to 3 mm. *Fruit* 20–30 × 11–16 mm, buff. *Flowering time* February to March.

Aloe dewetii is found in Swaziland and KwaZulu-Natal, where it grows in windswept grassland in the middleveld. The area in which it occurs is fairly cold in winter. The soil is heavy and the rainfall high, with a summer maximum. Map 39.

The very shiny leaf surfaces distinguish this species from other maculates. The teeth on the leaf margins and the basal swellings of the flowers are the largest in the section. The inflorescence is the tallest in the section.

This species is named after Mr J.F. de Wet, who was headmaster of the Vryheid Junior School at the time of the first description of the plant. Mr De Wet collected some of the original material (*De Wet in Reynolds* 2321 and possibly the type) from which the species was described.

Vouchers: *Compton* 28788 (NBG, PRE); *Gerstner* 3898 (PRE); *Nichols* 731 (NH, PRE); *Ward* 2147 (NH, PRE).

54. *Aloe parvibracteata* Schönland in *Records of the Albany Museum* 2: 139 (1907); A.Berger: 330 (1908); Reynolds: 276 (1950); Jeppe: 71 (1969); Bornman & D.S.Hardy: 141 (1972); West: 52 (1974); Compton: 101 (1976); B.-E. van Wyk & G.F.Sm.: 212 (1996). Type: Mozambique, Maputo, Burt Davy 2853 (GRA!).

A. burgersfortensis Reynolds: 31 (1936f); Reynolds: 274 (1950); Jeppe: 90 (1969); Bornman & D.S.Hardy: 139 (1972); B.-E. van Wyk & G.F.Sm.: 186 (1996). Type: Mpumalanga, Lydenburg District, Reynolds 1465 (PRE, holo.!; BOL!).

A. pongolensis Reynolds: t. 603 (1936h); Reynolds: 45 (1937a). Type: KwaZulu-Natal, near Pongola, Reynolds 1101 (PRE!).

A. pongolensis Reynolds var. *zuluensis* Reynolds: 46 (1937a). *A. parvibracteata* Schönland var. *zuluensis* (Reynolds) Reynolds: 278 (1950); Jeppe: 71 (1969); Bornman & D.S.Hardy: 141 (1972). Type: KwaZulu-Natal, White Umfolozi Valley, Reynolds 2017 (PRE).

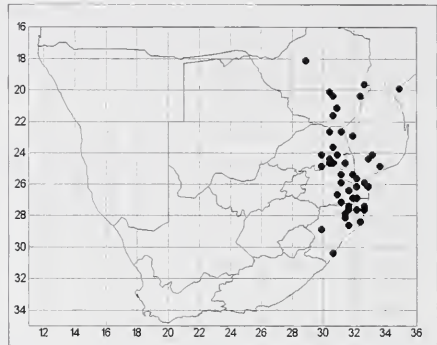
A. keithii Reynolds: 47 (1937a); Reynolds: 278 (1950); Jeppe: 72 (1969); Bornman & D.S.Hardy: 143 (1972); Compton: 100 (1976). Type: Swaziland, south of Siteki, Reynolds 1983 (PRE, holo.; SRGH!).

A. lusitanica Groenew.: 13 (1937b); Glen, G.F.Sm. & D.S.Hardy: 98 (1995). Lectotype: Mozambique, Maputo, F.Z. van der Merwe PRE24087 (PRE!).

Plants stemless or very short-stemmed, 200–400 mm tall excluding inflorescence, suckering freely to form large, dense groups. *Leaves* 10–15 per rosette, spreading to decurved, 300–500 × 30–80 mm, slightly channelled, upper surface with many whitish spots in irregular transverse bands, lower surface usually unspotted. *Inflorescence* with 4–9 ultimate branches, 1.0–1.5 m tall; racemes cylindric, subulax; bracts deltoid-cirrhous, ± 9–12 × 3 mm, 5–7-nerved. *Flowers* dull red, 24–33 mm long, mouth downturned; outer segments free for 8–10 mm, inner segments dorsally adnate to outer; pedicels 7–17 mm long. *Anthers* exserted 1–2 mm. *Ovary* 7.0–10.0 × 2.5–3.5 mm, green; style exserted 1–2 mm. *Fruit* 20–23 × 11–13 mm, purplish brown. *Flowering time* June to July.

Found in the Northern Province, Mpumalanga, Swaziland, and KwaZulu-Natal; also in Mozambique and Zimbabwe. The typical habitat of *A. parvibracteata* is hot, thorny lowveld, and in similar thorny woodland in the Lebombo Mountains. It has no specific requirements for soil, being found to grow equally well on heavy clay and in cracks in rock. Map 40.

In this species the leaf sap usually dries purplish violet, but exceptional specimens with sap drying golden yellow are known. Differences between this species and its close allies *A. greatheadii* (no. 46) and *A. greenii* (no. 49) are discussed under those species. *A. parvibracteata* is most usefully separated from *A. zebrina*



MAP 40.—*Aloe parvibracteata*

(no. 56) by the flowering season (winter—July, not autumn—March) and the leaf sap drying purple not yellow, but both of these characters are known to break down. This species is part of a complex that requires detailed investigation. Although the typical form of this species has bracts that are unusually small for a maculate aloe (hence the name), plants more commonly have long, narrow bracts.

The Ronga name *inanga* is recorded on the specimen Mogg 27147 (J, K). The Bakone of Sekhukhuneland (Lebowa) use the heated leaf as a poultice on sores (Watt & Breyer-Brandwijk 1963). Anderson & Pooley (1977) record that leaves and fruits of this species are occasionally eaten by nyala (*Tragelaphus angasi*) in the Ndumu Game Reserve.

Vouchers: Buitendag 839 (NBG, PRE); Leach 9839 (PRE); Miller S113 (PRE); Reynolds 1474 (PRE); Van der Schijff 614 (PRE).

Hybrid:

A. parvibracteata × *A. greatheadii* var. *davyana* (no. 46b). See *A. greatheadii* var. *davyana*.

55. *Aloe simii* Pole Evans in Transactions of the Royal Society of South Africa 5: 704 (1917); Reynolds: 280 (1950); Jeppe: 79

(1969); Bornman & D.S.Hardy: 145 (1972); B.-E. van Wyk & G.F.Sm.: 220 (1996). Type: Mpumalanga, near Sabie, *Sim 137* (PRE!).

Plants stemless, 250–400 mm tall excluding inflorescence, usually solitary. *Leaves* 15–20, erectly spreading, 350–600 × 80–120 mm, deeply channelled to U-shaped in section, pale green, usually unspotted, obscurely lined on both surfaces. *Inflorescence* with ± 15 ultimate branches, 1.0–1.5 m tall; racemes cylindric, lax; bracts narrowly deltoid-acuminate, 17–20 × 2.0–3.5 mm, 3–7-nerved. *Flowers* strawberry-pink, 27–40 mm long, subclavate above basal constriction; outer segments free for 9–12 mm, inner segments mostly dorsally adnate to outer; pedicels 9–15 mm long, lengthening slightly in fruit. *Anthers* exserted 1–3 mm. *Ovary* 5–8 × 2–4 mm, green; style exserted 1–3 mm. *Fruit* 21–30 × 12–17 mm. *Flowering time* February to March.

Aloe simii is endemic to Mpumalanga where it grows in open woodland, in areas with a lush grass understorey. The temperatures and rainfall are fairly high, and the soils are heavy loam and clay. Map 41.

The leaves of this species are deeply channelled into a U-shape in section; this character and the milky green colour of the leaves separate it from all others in the section. The leaves

are generally suberect, which is unusual in this section.

This species is named after Dr T.R. Sim (1858–1938), a noted horticulturist and botanist who collected extensively in the Eastern Cape and KwaZulu-Natal. His works on southern African bryophytes and the forests of the Cape Colony and Portuguese East Africa, as the territories were then called, laid the foundations of these branches of study (Gunn & Codd 1981).

Vouchers: *Henderson 1610* (NBG); *Leach 306* (K, PRE, SRGH); *Reynolds 2283* (PRE); *Van der Merwe 14* (PRE).

56. *Aloe zebrina* Baker in Transactions of the Linnean Society of London 1: 264 (1878b); Baker: 464 (1898a); Rendle: 45 (1899); A.Berger: 207 (1908); Reynolds: 281 (1950); Reynolds: 89 (1966); Jeppe: 87 (1969); Sölch, Roessler & Merxm.: 19 (1970); Bornman & D.S.Hardy: 147 (1972); West: 49 (1974); Jankowitz: 12 (1975); B.-E. van Wyk & G.F.Sm.: 232 (1996). Type: Angola, Cacuaco, *Welwitsch 3721* (LISU, lecto.; BM!, K; designated by Reynolds 1966).

A. platyphylla Baker: 264 (1878b); Baker: 463 (1898a); A.Berger: 207 (1908). Type: Angola, Pungo Andongo, *Welwitsch 3722* (K, lecto.!; BM!, LISU).

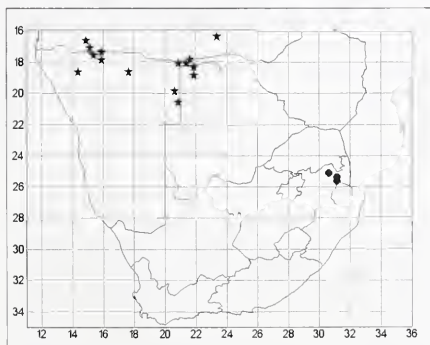
A. constricta Baker: 168 (1880a); Baker: 464 (1898a); Reynolds: 523 (1966). Type: Mozambique, near Sena, *Kirk 34* (K).

A. transvaalensis Kuntze: 314 (1898); A.Berger: 211 (1908); Reynolds: 114 (1936a); Pole Evans: t. 636 (1936b); Reynolds: 272 (1950); Jeppe: 97 (1969); Bornman & D.S.Hardy: 137 (1972). Type: Gauteng, Pretoria, *Kuntze s.n.* (NY, holo.; K!, PRE, photo.!).

A. lugardiana Baker: 135 (1901b); A.Berger: 207 (1908). Type: Botswana, Botletle River, *E.J. Lugard s.n.* (K).

A. baunii Engl. & Gilg in Warb.: 191 (1903); A.Berger: 226 (1904); Hemsley: t. 7948 (1904). Type: Angola, Chirumbu, *Baum 275* (B).

A. bamangwatensis Schönland: 122 (1904). Type: Botswana, Palapye Road, *Schönland GRAA7223* (GRA!).



MAP 41.—● *Aloe simii*
★ *A. angolensis*

A. laxissima Reynolds: 28 (1936f); Jeppe: 98 (1969); Bornman & D.S.Hardy: 135 (1972). Type: Northern Province, near Nebo, *Reynolds* 767 (PRE, holo.!; BOL!).

A. amnophila Reynolds: 116 (1936a); Reynolds: 270 (1950); Jeppe: 99 (1969); Bornman & D.S.Hardy: 133 (1972). Type: Northern Province, Pietersburg, *Reynolds* 1345 (PRE!).

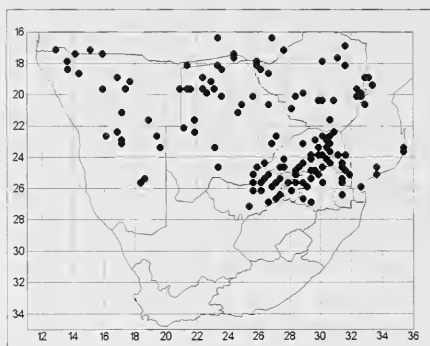
A. komatiensis Reynolds: 120 (1936a); Reynolds: 254 (1950); Jeppe: 73 (1969); Bornman & D.S.Hardy: 117 (1972). Type: Mpumalanga, Komatipoort, *Reynolds* 1543 (PRE, holo.!; BOL!).

A. lettyae Reynolds: 137 (1937c); Reynolds: t. 764 (1940a); Reynolds: 259 (1950); Jeppe: 78 (1969); Bornman & D.S.Hardy: 121 (1972); B.-E. van Wyk & G.F.Sm.: 202 (1996). Type: Northern Province, Duiwelskloof, *Reynolds* 2339 (PRE, holo.!; BOL!).

A. vandermerwei Reynolds: 268 (1950); Jeppe: 88 (1969); Bornman & D.S.Hardy: 131 (1972). Type: Northern Province, Gravelotte, F.Z. van der Merwe *PRE*21288 (PRE!).

Plants stemless or short-stemmed, 150–300 mm tall excluding inflorescence, suckering freely to form large, dense groups. *Leaves* 15–25 per rosette, narrowly ensiform, 200–600 × 35–80 mm, slightly channelled, upper surface with many whitish spots, usually in irregular transverse bands, lower surface with few to many spots. *Inflorescence* with 6–many ultimate branches, 1.0–1.7 m tall; racemes cylindric, elongate, lax, terminal; bracts deltoid-cirrhous, ± 5–12 × 2 mm, 3–many-nerved. *Flowers* very pale to deep pink, dull or glossy, 20–30 mm long, mouth straight; outer segments free for 5–7 mm, inner segments adnate to outer; pedicels 6–11 mm long, lengthening to ± 15 mm in fruit. *Anthers* exserted up to 3 mm. *Ovary* ± 8 × 2–3 mm, green; style exserted up to 3 mm. *Fruit* 21–38 × 13–18 mm, greyish purplish brown. *Seeds* charcoal-grey, ± 6.0 × 3.0 × 1.5 mm, with conspicuous brown wing. *Flowering time* mostly February to April, but plants flowering as early as November and as late as May have been recorded.

Aloe zebrina is widely distributed, and occurs in a variety of veld types and on a variety of soils in Namibia, Botswana, the Northern Province, North-West, Gauteng, Mpumalanga and Swaziland; also in Angola, Zambia, Malawi, Mozambique and Zimbabwe. Temperatures



MAP 42.—*Aloe zebrina*

are usually high in summer but may, in parts of its range, become very low in winter. Rainfall in the distribution area of this species is high in the extreme northwest, but low elsewhere, with a summer maximum throughout. Map 42.

Although superficially similar to *A. great-headii* (no. 46), this species is useless to bees as the flower is too narrow to admit them. Other characters separating this species from *A. great-headii* and *A. parvibracteata* (no. 54) are discussed under those species. *A. zebrina* is a member of a difficult complex which would repay intensive study.

The specific epithet refers to the leaves, on which the spots are arranged in irregular transverse bands giving the appearance of stripes like a zebra's. Common names recorded for this species include *edundu* (Kwanyama), */ganya* (!ho), */hori*, */huru*, and */gikve* (Narō). The flowers are boiled and eaten fresh or dried in Owambo, where the plant is said to have been brought from Angola.

Vouchers: *Dyer* 3186 (PRE); *Giess* 11482 (PRE); *Huntley* 1225 (PRE); *Meense* 10236 (LISC. PRE); *Reynolds* 8987 (PRE).

Hybrids:

1. *A. zebrina* × *A. swynnertonii* (no. 44). See *A. swynnertonii*.

2. *A. zebrina* × *A. littoralis* (no. 114) (= *A. angolensis* Baker). This species of hybrid origin is discussed fully below.

57. *Aloe angolensis* Baker in Transactions of the Linnean Society of London 1: 263 (1878b); Baker: 466 (1898a); Rendle: 44 (1899); A. Berger: 239 (1908); Reynolds: 310 (1966). Type: Angola, Barra do Bengo, Welwitsch 3728 (BM, holo.; LISU).

A. esculenta L.C. Leach: 249 (1971); D.S. Hardy: 521 (1974); Jankowitz: 10 (1975). Type: Angola, Leach & Cannell 13818 (PRE, holo.; BM, LISU, SRGH!).

Plants stemless or short-stemmed, 0.3–1.0 m tall excluding inflorescence, usually solitary, sometimes suckering. *Leaves* 15–25 per rosette, narrowly ensiform, 500–700 × 40–80 mm, slightly channelled, with few to many whitish spots irregularly arranged on upper surface only. *Inflorescence* with 3–7 ultimate branches, 1.0–2.2 m tall; racemes cylindric, subdense; bracts deltoid-cirrhous, 11–12 × 3–4 mm, many-nerved. *Flowers* pink to yellow or cream-coloured, 21–32 mm long, mouth straight; outer segments free for 15–18 mm, inner segments adnate to outer; pedicels 4–6 mm long, lengthening to ± 13 mm in fruit. *Anthers* exerted up to 2 mm. *Ovary* 5–7 × 2–3 mm, green; style exerted up to 5 mm. *Fruit* ± 20 × 12 mm. *Flowering time* June to August.

Aloe angolensis is found in Namibia and Botswana; also in Angola and Zambia. It occurs typically but not exclusively in semidesert grassland on Kalahari sand, which may be flooded in summer and completely without surface water in winter. Winter temperatures in its area of distribution are relatively high. Map 41.

This species is placed here immediately after one of its putative parents, as it keys out to this section more easily than to section 23, *Pachydendron*, to which the other parent species belongs. The parentage is thought to be *A. zebrina* (no. 56) × *A. littoralis* (no. 114). The spots on the leaves of this species are far less regularly arranged than in any other member of this section, and it fairly often develops a short erect

stem. Flower characters are intermediate between those of the two putative parent species.

The specific epithet records that the type specimen was collected in Angola.

Vouchers: *Giess* 13726 (PRE, WIND); *Leach* 12294 (PRE); *Reynolds* 2423 (PRE); *Smith* 1412 (PRE); *Story* 5135 (PRE).

58. *Aloe grandidentata* Salm-Dyck, *Observationes botanicae in Horto Dyckensi* 3: 3 (1822); Salm-Dyck: 23, t. 4 (1854); Baker: 314 (1896a); A. Berger: 215 (1908); Pole Evans: t. 286 (1928c); Reynolds: 285 (1950); Jeppe: 100 (1969); Bornman & D.S. Hardy: 149 (1972); B.-E. van Wyk & G.F. Sm.: 194 (1996). *Iconotype*: Salm-Dyck, *Monographia generum Aloes et Mesembryanthemi*: 23, t. 4 (1854).

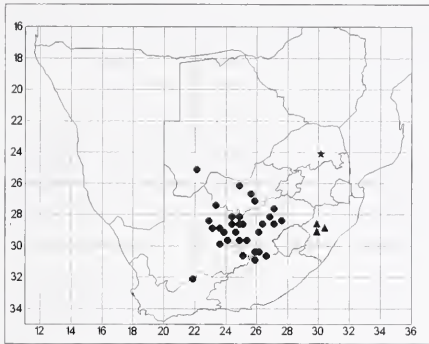
Plants stemless or very short-stemmed, 150–300 mm tall excluding inflorescence, suckering freely to form large groups. *Leaves* 10–20 per rosette, 100–250 × 35–75 mm, both surfaces with many whitish spots in irregular undulating transverse bands. *Inflorescence* with 4–7 ultimate branches, ± 900 mm tall; racemes dense, conical, not secund; bracts narrowly deltoid-acuminate, 8–10 × 3–4 mm, 1–5-nerved. *Flowers* dull reddish, 19–30 mm long, clavate above constriction above ovary; outer segments free for 6–10 mm, inner segments dorsally adnate to outer; pedicels 5–13 mm long. *Anthers* exerted up to 5 mm. *Ovary* 6.0–9.0 × 1.5–3.0 mm, olive-green; style exerted up to 5 mm. *Fruit* 22–25 × 9–11 mm, greenish. *Flowering time* August to September.

Found in Botswana, North-West, the Free State and the Northern, Western and Eastern Cape. In the west of its range, *A. grandidentata* occurs in karroid scrub on ironstone ridges, but further east it occurs on calccrete as well. Rainfall and winter temperatures throughout its range are low. Map 43.

The clavate flowers distinguish this species from all other members of the section. This species does not grow in populations mixed with any other maculate aloes; geographical



FIGURE 9.—Section *Pictae*. *Aloe monotropa*: 1, upper portion of inflorescence showing the terminal and one lateral raceme; 2, leaf; 3, bract from base of one of the lower branches of inflorescence; 4, longitudinal section of flower, $\times 1.6$; 5, habit, much reduced. Taken from Verdoorn (1961a).



MAP 43.—● *Aloe grandidentata*
★ *A. monotropa*
▲ *A. prinslooii*

distribution can therefore be used to distinguish it from others of the genus.

Salm-Dyck (1822) was evidently so impressed by the large marginal teeth of the leaves of this species that his name for it draws attention to them. However, they are no larger than those of many other maculates.

Vouchers: *Henrici 1835* (PRE); *Leistner 1434* (PRE); *Muller 1020* (PRE); *Plowes 3216* (PRE, SRGH, STE); *Reynolds 1571* (NH, PRE, SAM).

Hybrids:

1. *A. grandidentata* × *A. broomii* var. *broomii* (no. 26a). See *A. broomii*.

2. *A. grandidentata* × *A. maculata* (no. 45). See *A. maculata*.

3. *A. grandidentata* × *A. claviflora* (no. 70). Vouchers: *Broom s.n.* (GRA); *Reynolds 985* (BOL).

4. *A. grandidentata* × *A. hereroensis* var. *hereroensis* (no. 76a). Vouchers: *H. Hall 930* (NBG); *Reynolds 977* (BOL).

59. ***Aloe monotropa*** *I. Verd.* in *The Flowering Plants of Africa* 34: t. 1342 (1961a);

Jeppe: 101 (1969); *Bornman & D.S. Hardy: 93* (1972); *D.S. Hardy: 511* (1974); *B.-E. van Wyk & G.F.Sm.: 208* (1996). Type: Northern Province, Dublin Mine, *Smuts 1560* (PRE!).

Plants 200–300 mm tall excluding inflorescence, stemless or short-stemmed; stem usually prostrate, solitary or suckering to form small groups. *Leaves* ± 20 per rosette, spreading, 340–400 × 45–60 mm, slightly channelled, narrowed towards base, upper surface with lines and irregular pale green spots, lower surface lineate and more distinctly spotted. *Inflorescence* with ± 11 ultimate branches; racemes secund, subax, cylindric; bracts narrowly deltoid-acuminate, 6.0–8.0 × 1.0–2.5 mm, 3-nerved. *Flowers* old rose, rarely yellow, 22–30 mm long, subclavate; outer segments free for 5–7 mm, inner segments dorsally adnate to outer in lower half; pedicels 7–11 mm long. *Antthers* not or hardly exerted. *Ovary* ± 5.0 × 1.5 mm, green; style exerted up to 2 mm. *Fruit* ± 15–20 × 11 mm, dark grey-brown. *Seeds* ± 3.0 × 1.5 × 1.0 mm, narrowly winged, almost black. *Flowering time* November to December. Figure 9.

Aloe monotropa grows on rocky slopes on the lateral mountain chains associated with the escarpment in the Northern Province. It occurs in deep shade to semishade in forests and on forest margins, in an area of very high, mostly summer rainfall. Map 43.

The secund racemes of this species are unique in section *Pictae*, and recall section 21, *Ortholophae*. However, the spotted leaves and basal inflation of the flower make it quite clear that this species belongs to this section. The spots on the leaves are more irregularly arranged than in any other species in this section except *A. angolensis* (no. 57).

The specific epithet is derived from two Greek words which may be translated as 'one in a bundle' or 'one of a kind'. The allusion is to the combination of secund racemes (characteristic of section *Ortholophae*) with spotted leaves and inflated flower bases (characteristic of section *Pictae*). This combination is unique in *Aloe*.

Voucher: *Smuts 1560* (PRE).

60. ***Aloe prinslooii*** *I. Verd. & D.S. Hardy* in *The Flowering Plants of Africa* 37: t. 1453 (1965); *Jeppé*: 102 (1969); *Bornman & D.S. Hardy*: 91 (1972); *D.S. Hardy*: 513 (1974); *B.-E. van Wyk & G.F. Sm.*: 216 (1996). Type: KwaZulu-Natal, near Colenso, *Hardy 1907* (PRE!).

Plants stemless, 150–250 mm tall excluding inflorescence, usually solitary. *Leaves* 16–30, 140–200 × 40–80 mm, biconvex to slightly channelled, both surfaces with few to many white spots, usually irregular, sometimes in transverse bands, denser on upper surface. *Inflorescence* with 2–5 ultimate branches, ± 600 mm tall; racemes dense, capitate; bracts deltoid-cirrhous, 15–30 × 3–5 mm, ± 7-nerved. *Flowers* greenish white becoming tinged with pink, 13–17 mm long; segments free for almost half their length; pedicels 12–30 mm long, erect. *Anthers* not or hardly exerted. *Ovary* 4.0–10.0

× 2.0–2.5 mm, green; style not or hardly exerted. *Fruit* 14–18 × 10–12 mm, grey. *Seeds* ± 4.0 × 2.5 × 1.0 mm, hardly winged, brown. *Flowering time* August to September.

Aloe prinslooii occurs in the dense grass understorey of open woodland in the KwaZulu-Natal midlands. The soil is thin, the rainfall relatively low, the summers are hot and the winters very cold. Map 43.

The very dense, almost spherical racemes of small, whitish flowers distinguish this species from all others in this section. Sterile specimens are easily confused with *A. maculata* (no. 45), and there seems to be no vegetative character that distinguishes unambiguously between these two species.

This species is named after its discoverer, Mr G.J. Prinsloo, a keen amateur grower of aloes.

Voucher: *Hardy 1909* (PRE).

10. Section **Paniculatae**

Section **Paniculatae** *Salm-Dyck ex Kunth*, *Enumeratio plantarum* 4: 522 (1843). Type species: *A. striata* Haw.

Series *Striatae* Reynolds: 114 (1940b).

Series *Paniculatae* Salm-Dyck ex Kunth, Reynolds: 294 (1950).

Plants solitary, stemless or short-stemmed; stems usually prostrate. *Leaves* rosulate; broad, ovate-lanceolate, slightly channelled to D-shaped in section; surfaces striate, sometimes also with irregular whitish spots, margins entire or minutely dentate. *Inflorescence* a much-branched panicle; sterile bracts only subtending branches; racemes dense to lax, conical. *Flowers* with a subglobose basal swelling, then cylindric to subclavate; outer segments connate for most of their length. *Anthers* not or hardly exerted. *Style* not or hardly exerted.

- 1a Leaves striate, unspotted 61. *A. striata*
- 1b Leaves with spots, sometimes striate as well:
 - 2a Leaves fleshy, narrow (4–5 times as long as wide); flowers orange-red; plants indigenous to the Northern Cape 63. *A. buhrii*
 - 2b Leaves leathery, broad (2–3 times as long as wide); flowers yellow tinged orange; plants indigenous to the Eastern Cape 62. *A. reynoldsii*

Plants in this section resemble one another in their stemless habit, broad, relatively flat leaves and much-branched inflorescences. The leaves are lined and may be spotted as well. In section 7,

Rhodacanthae, the leaves are also lined, but are narrower and distinctly dentate, not entire to minutely crenulate or denticulate. Plants of section *Rhodacanthae* have simple to 2- or 3-branched inflorescences, not the many-branched inflorescences characteristic of this section.

61. *Aloe striata* Haw. in Transactions of the Linnean Society of London 7: 18 (1804); W.T.Aiton: 295 (1811); Haw.: 81 (1812); Haw.: 44 (1819); Baker: 311 (1896a); A.Berger: 196 (1908); Pole Evans: t. 55 (1922a); Reynolds: 113 (1940b); Reynolds: 294 (1950); Jeppe: 63 (1969); Bornman & D.S.Hardy: 151 (1972); Glen & G.F.Sm.: 40 (1995); B.-E. van Wyk & G.F.Sm.: 162 (1996). Neotype: Eastern Cape, near Grahamstown, *Bottomley* PRE27 (PRE!).

A. paniculata Jacq.: 48, t. 68 (1809); Schult. & Schult.f.: 691 (1829). Iconotype: Jacq.: 48, t. 68 (1809).

A. albocincta Haw.: 43 (1819); Haw.: 40 (1821); Hook.f.: t. 5210 (1860). No type cited.

A. hanburiana Naud.: 165 (1875). No type cited.

A. striata Haw. var. *oligospila* Baker: 588 (1894); Baker: 312 (1896a). Type: Eastern Cape, no precise locality, *Cooper s.n.* (K!).

Plants 300–700 mm tall excluding inflorescence, stemless or with decumbent stems up to 1 m long; rarely with stem branched. *Leaves* 12–20, 300–500 × 70–200 mm, glaucous to somewhat reddish tinged, striate, not spotted, margins entire, horny, pale pink. *Inflorescence* up to ± 1 m tall; racemes dense, conical to capitate; bracts deltoid-acute, 5–10 × 3–4 mm, ± 5-nerved. *Flowers* coral-red, rarely yellow, 19–30 mm long; outer segments free for 4–8 mm, inner segments dorsally adnate to outer; pedicels 8–25 mm long. *Anthers* exerted up to 2 mm. *Ovary* 6.0–9.0 × 1.5–3.0 mm, pale green; style exerted up to 2 mm. *Fruit* 16–20 × 9–12 mm, grey-brown. *Seeds* ± 3 × 2 × 1 mm, black with narrow brown wing. Figure 10.

Differences between this species on the one hand and *A. buhrri* (no. 63) and *A. reynoldsii* (no. 62) on the other, are discussed under those species.

The specific epithet refers to the more or less conspicuous pale longitudinal lines or striae on the leaves.

Three subspecies are recognised:

- 1a Racemes lax; plants indigenous to the Northern Cape and Namibia
61c. subsp. *karasbergensis*
- 1b Racemes dense:
 - 2a Leaf margins white to yellow; flowers yellow; flowering season December to January; plants indigenous to Namaqualand
61b. subsp. *komaggasensis*
 - 2b Leaf margins pink; flowers usually red; flowering season August to October; plants indigenous to the Eastern and southern Cape
61a. subsp. *striata*

61a. subsp. *striata*.

Description as for species. *Flowering time* August to October.

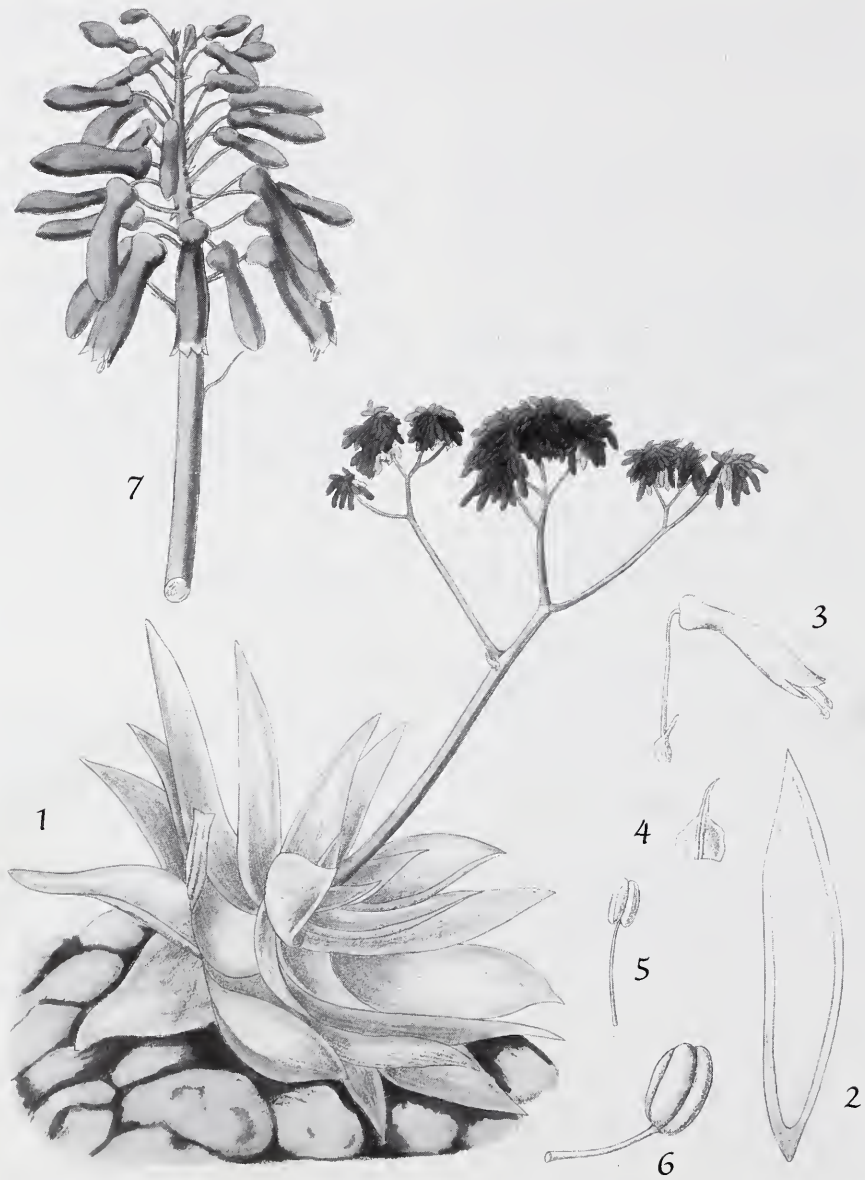
This subspecies is endemic to the Eastern and southern Cape and occurs in a variety of habitats, from valley bushveld to bare, stony hillsides in grassland. Rainfall, temperatures and soils vary widely in the area where this subspecies is quite common. The pink, horny leaf margins and the spring (August to October), not summer (December to March) flowering season separate the typical subspecies from the other two recognised here. Map 44.

The common name coral aloe is recorded for this species (Reynolds 1950).

Vouchers: *Dahlstrand* 1239 (J, STE); *Galpin* 2619 (PRE); *Marloth* 5953 (PRE); *Muller* 699 (PRE); *Reynolds* 5493 (NH, PRE).

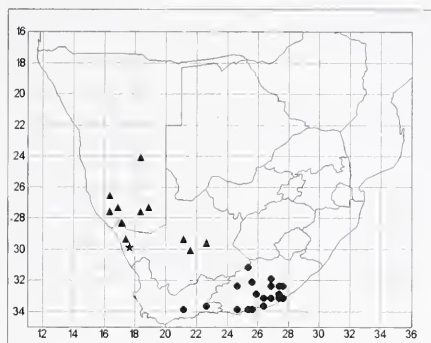
Hybrids:

- 1. *A. striata* subsp. *striata* × *A. maculata* (no. 45). See *A. maculata*.



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FIGURE 10.—Section *Paniculatae*. *Aloe striata*: 1, plant showing characteristic habit; 2, transverse section of leaf; 3, flower; 4, bract; 5, stamen; 6, young fruit; 7, inflorescence. Taken from Pole Evans (1922a).



MAP 44.—● *Aloe striata* subsp. *striata*
 ★ *A. striata* subsp. *komaggasensis*
 ▲ *A. striata* subsp. *karasbergensis*

2. *A. striata* subsp. *striata* × *A. africana* (no. 109). Voucher: *Reynolds 1590* (PRE).

3. *A. striata* subsp. *striata* × *A. ferox* (no. 110). Voucher: *Glen 1513* (PRE).

61b. subsp. **komaggasensis** (*Kritzinger & Van Jaarsv.*) *Glen & D.S.Hardy* in *South African Journal of Botany* 53: 491 (1987a).

A. komaggasensis *Kritzinger & Van Jaarsv.*, in *Van Jaarsv.*: 287 (1985). Type: Northern Cape, Komaggas, *Kritzinger 12* (NBG, holo.!; PRE!).

Leaf margins white to yellowish. *Racemes* capitate; bracts deltoid, 8–15 × 2–6 mm. *Flowers* yellow. *Anthers* hardly exserted. *Ovary* ± 5 × 2 mm; style hardly exserted. *Fruit* ± 20 × 10 mm. *Flowering time* December to January. Other characters as for subsp. *striata*.

Endemic to hillside succulent karoo in Namaqualand. The type locality of this subspecies is in an area of marginal renosterbos veld grading into succulent karoo. The soil is clayey with many stones. Rainfall is erratic in quantity and season, but peaks in winter. Map 44.

The yellow flowers, obscure striations on the leaves and denticulate leaf margins separate this subspecies from the other two recognised here.

Sometimes the leaves of this subspecies have a few obscure spots, suggesting an affinity with *A. bulirii* (no. 63).

This subspecies is named after the nearest settlement to its type locality. Komaggas is a small village in Namaqualand, almost due west of Springbok, the main centre of the area.

Voucher: *Kritzinger 12* (NBG, PRE).

61c. subsp. **karasbergensis** (*Pillans*) *Glen & D.S.Hardy* in *South African Journal of Botany* 53: 491 (1987a).

A. karasbergensis *Pillans*: 233 (1928); *Pole Evans*: t. 720 (1938b); *Reynolds*: 113 (1940b); *Reynolds*: 297 (1950); *Jepp*: 64 (1969); *Sölch, Roessler & Merxm.*: 17 (1970); *Bornman & D.S.Hardy*: 153 (1972); *Jankowitz*: 46 (1975). Type: Northern Cape, Richtersveld, *Pillans 5848* (BOL!).

Plants usually stemless. *Leaf margins* dull white, entire, sometimes crenulate. *Inflorescence* 500–600 mm tall; racemes lax, conical; bracts deltoid, 3.0–6.0 × 2.5–3.0 mm; pedicels 6–12 mm long. *Flowers* pink to pale coral-red; outer segments free for 5–6 mm. *Anthers* exserted 1–2 mm. *Ovary* 6.0–7.0 × 2.5–3.0 mm, green; style exserted 1–2 mm. *Fruit* ± 18 × 13 mm. *Flowering time* January to March.

This subspecies is found in Namibia and the Northern Cape, where it grows on semidesert sand and stony mountain slopes in areas with very low and erratic rainfall. In different parts of its range, peak rainfall is received in summer or in winter. Map 44.

The short, lax inflorescences of this subspecies distinguish it from the other two recognised here. Usually the leaf margins in this subspecies are entire, like in subsp. *striata*, but sometimes they are crenulate, recalling subsp. *komaggasensis*. Some populations of subsp. *karasbergensis* frequently sucker (particularly those from the Sperrgebiet, Namibia).

The subspecific epithet recalls the locality where one of the two first specimens (*Pearson* in *PSME7966*, not the type) was collected. One

of the Percy Sladen Memorial Expeditions was to the Great Karasberg, an almost inaccessible mountain range in southern Namibia. It was on this expedition that Pearson made the specimen cited above.

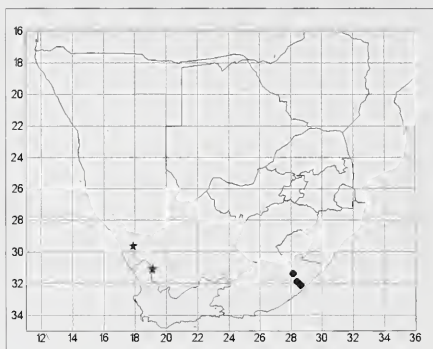
Vouchers: *Acocks* 16397 (BM, PRE); *Giess* 10438 (MO, PRE, WIND); *Hardy* 2274 (PRE); *Pearson* 7966 (BOL, K, SAM, STE); *Van der Merwe* 1406 (PRE, SAM).

62. *Aloe reynoldsii* Letty in *The Flowering Plants of South Africa* 14: t. 558 (1934c); Reynolds: 113 (1940b); Reynolds: 299 (1950); Jeppe: 65 (1969); Bornman & D.S.Hardy: 155 (1972); B.-E. van Wyk & G.F.Sm.: 160 (1996). Type: Eastern Cape, near Idutywa, *Reynolds* 140 (= PRE16645) (PRE, holo!; BOL!).

Plants stemless or short-stemmed, 300–600 mm tall excluding inflorescence; stems branched into small groups. *Leaves* 16–20 per rosette, 160–350 × 75–120 mm, lined, glaucous green with dull white spots, margins horny, minutely denticulate. *Inflorescence* a 400–600 mm tall panicle; racemes subax, subcapitate; bracts deltoid-acuminate, 5–10 × 2–4 mm, 3–5-nerved. *Flowers* yellow tinged orange, 22–30 mm long, funnel-shaped above constriction above ovary; outer segments free for 4–5 mm, inner segments adnate to outer; pedicels 14–25 mm long. *Anthers* exserted 1–2 mm. *Ovary* ± 7 × 2 mm; style exserted 1–2 mm. *Fruit* ± 22 × 10 mm. *Flowering time* September to October.

Aloe reynoldsii occurs in a region of much higher rainfall than other members of this section. It is restricted to cracks in rock in sheer cliffs in a small part of the Eastern Cape. Map 45.

The leaves of *A. reynoldsii* are thinner than any others in the section and are lined with numerous scattered H-shaped spots. The pink cartilaginous leaf margins have distinct but minute teeth. Plants of this species branch and rebranch to form clumps, a character not found in other species of the section.



MAP 45.—● *Aloe reynoldsii*
★ *A. buhrii*

This species is named after Dr G.W. Reynolds, whose contributions to the study of the genus *Aloe* are greater than those of any other individual botanist.

Vouchers: *Reynolds* PRE39393 (PRE); *Stayner* NBG498/58 (NBG).

63. *Aloe buhrii* Lavranos in *Journal of South African Botany* 37: 37 (1971); Bornman & D.S.Hardy: 289 (1972); D.S.Hardy: 520 (1974); B.-E. van Wyk & G.F.Sm.: 126 (1996). Type: Northern Cape, Calvinia, *Buhr & Lavranos* 8163 (PRE!).

Plants stemless, ± 300 mm tall excluding inflorescence, forming small groups. *Leaves* ± 16, arcuate-erect to spreading, 200–400 × 40–90 mm, spotted, margins horny, pale red, minutely denticulate. *Inflorescence* a panicle up to 600 mm tall; racemes dense, subcapitate; bracts deltoid-acute, 5–10 × 2–4 mm, 3–5-nerved. *Flowers* orange-red, 16–25 mm long; outer segments free for 4–7 mm, inner segments adnate to outer; pedicels 9–25 mm long. *Anthers* exserted 1–3 mm. *Ovary* 4.0–5.0 × 2.0–2.5 mm, pale green; style exserted 3–6 mm. *Fruit* not seen. *Flowering time* July.

Aloe buhrii is endemic to the Northern Cape and occurs near the top of mountains in the win-

ter-rainfall area. It grows on Malmesbury shales, in an area with mild winters and hot summers. Map 45.

The leaves of *A. buhrii* are more conspicuously spotted than those of other species in this section. They are firmer, fleshier and narrower than those of *A. reynoldsii* (no. 62). The dense racemes are similar to those of *A. striata* subsp. *striata* (no. 61a) and subsp. *komaggasensis* (no. 61b), but differ from those of *A. striata* subsp.

karasbergensis (no. 61c) and *A. reynoldsii*. The colour of the flowers is intermediate between that of *A. striata* subsp. *striata* and the yellow of *A. reynoldsii* and *A. striata* subsp. *komaggasensis*.

Elias S. Buhr, after whom this species is named, first recognised it as new. He brought it to the attention of Mr J.J. Lavranos, who published the first description.

Voucher: Anou. PRE58358 (PRE).

11. Section *Superpositae*

Section *Superpositae* (Pole Evans) Glen & D.S.Hardy, stat. nov. Type species: *A. suprafoliata* Pole Evans.

Series *Superpositae* Pole Evans in Transactions of the Royal Society of South Africa 5: 604 (1916); Reynolds: 115 (1940b); Reynolds: 302 (1950).

Plants solitary, stemless or caulescent. *Leaves* rosulate, in one species distichous in young (flowering) plants, lanceolate, very slightly channelled to D-shaped in section, unspotted, sometimes lined, margins dentate. *Inflorescence* simple or branched, if simple then with sterile bracts; racemes dense, cylindric. *Perianth* cylindric to narrowly ovoid; segments free to variously connate. *Anthers* shortly exserted. *Style* shortly exserted.

- 1a Inflorescence taller than 2 m; plants caulescent 66. *A. pretoriensis*
- 1b Inflorescence up to 2 m tall; plants stemless or almost so:
 - 2a Leaves distichous in young plants (up to flowering size); smooth; outer perianth segments free to base; bracts spatulate 64. *A. suprafoliata*
 - 2b Leaves rosulate, tuberculate at least in seedling stage; outer perianth segments connate for at least half their length; bracts ovate 65. *A. thorucroftii*

Plants in this section have rosulate and obliquely erect or rarely distichous and spreading leaves, and may be stemless or short-stemmed. They are characterised by large, showy cerise-pink flowers (in southern Africa; *A. crassipes*, of Zambia and Sudan, has yellow-green flowers) with included or shortly exserted anthers and styles.

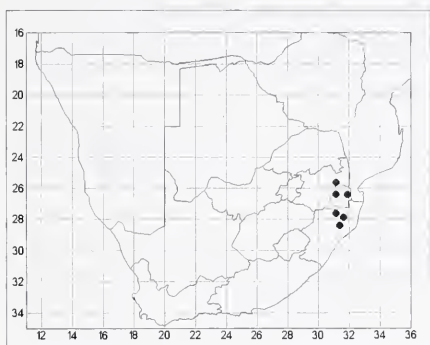
64. *Aloe suprafoliata* Pole Evans in Transactions of the Royal Society of South Africa 5: 603 (1916); Pole Evans: t. 733 (1939b); Reynolds: 115 (1940b); Reynolds: 302 (1950); Jeppe: 8 (1969); Bornman & D.S.Hardy: 157 (1972); Compton: 102 (1976); B.-E. van Wyk & G.F.Sm.: 164 (1996). Type: Swaziland, Stegi, Pole Evans 215 (PRE!).

Plants stemless or short-stemmed, 200–400 mm tall excluding inflorescence. *Leaves* ± 30,

distichous until first or second flowering, later rosulate, 250–400 × 50–70 mm, bluish green to bluish grey, sometimes tinged purplish. *Inflorescence* a simple raceme, 0.6–2.0 m tall, 2–6 per rosette; bracts spatulate, 15–20 × 6–13 mm, many-nerved. *Flowers* brilliant pink, 33–50 mm long; outer segments free to base, inner segments adnate to outer for 12–20 mm; pedicels 14–20 mm long, lengthening to ± 30 mm in fruit. *Anthers* not or hardly exserted. *Ovary* 5.5–9.0 × 1.5–3.0 mm, pale olive-green;



FIGURE 11.—Section Superpositae. *Aloe thorncroftii*: 1, inflorescence, $\times 0.8$; 2, leaf apex, $\times 0.8$. Taken from Glen & Hardy (1986).

MAP 46.—*Aloc suprafoliata*

style exserted 1–2 mm. *Fruit* not seen. *Flowering time* May to July.

This species is found in Mpumalanga, Swaziland and KwaZulu-Natal, and usually occurs in cracks in rock or near sheer cliffs, in montane grassland or in places where the soil is absent or too thin to support other vegetation. It seems to require a humus-rich soil. Map 46.

Aloc suprafoliata differs from its nearest ally, *A. thorncroftii* (no. 65), in the following ways: the leaves of young plants are always distichous and have smooth, glaucous surfaces; the flowers of this species, although long and showy, are not as long or as conspicuous as those of *A. thorncroftii*.

The plant from which the original description was drawn up was a young specimen flowering for (in all probability) the first time. In such plants the distichous leaves appearing pressed down upon one another are a very conspicuous feature, and the specific epithet draws attention to this.

Vouchers: *Codd & Dyer 2911* (PRE); *Leach 118* (SRGH); *Reynolds 1973* (PRE); *Strey 9830* (NH, PRE), *Ward 3400* (PRE).

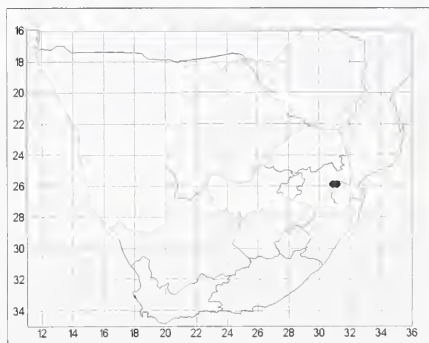
65. *Aloc thorncroftii* *Pole Evans* in Transactions of the Royal Society of South

Africa 5: 709 (1917); Reynolds: 116 (1940b); Reynolds: 304 (1950); Jeppe: 9 (1969); Bornman & D.S.Hardy: 159 (1972); Glen & D.S.Hardy: t. 1936 (1986); Glen & G.F.Sm.: 41 (1995); B.-E. van Wyk & G.F.Sm.: 166 (1996). Type: Mpumalanga, Barberton, *Thorncroft PRE247* (PRE!).

Plants stemless or short-stemmed, 250–500 mm tall excluding inflorescence. *Leaves* rosulate, 300–400 × 100–140 mm, bluish grey to purplish grey. *Inflorescence* a simple raceme, 0.8–1.0 m tall, 2–4 per plant; bracts ovate, 15–25 × 6–11 mm, many-nerved. *Flowers* brilliant pink, 40–55 mm long; outer segments connate for at least half their length, inner segments free but adnate to outer for ± two thirds of their length; pedicels 15–25 mm long, lengthening in fruit. *Anthers* not or hardly exserted. *Ovary* 9.0–12.0 × 2.0–3.5 mm; style exserted 1–2 mm. *Fruit* ± 20–25 × 10 mm. *Flowering time* September to October. Figure 11.

Endemic to Mpumalanga and confined to the Barberton serpentines. Map 47.

The leaves of seedling plants are rough with small tubercles, but these gradually disappear as plants mature. The flowers are among the largest and most striking in the genus. The dark green, red-tinted colour of the leaves is also diagnostic in the field.

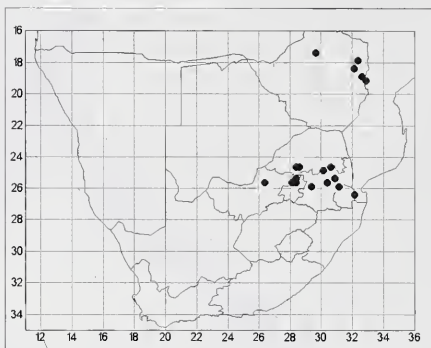
MAP 47.—*Aloc thorncroftii*

George Thorncroft, after whom this species is named, was apprenticed to a firm of grocers in London. He joined the crowds travelling to the (eastern) Transvaal goldfields, and arrived in Barberton in January 1887. Here he ran a hotel and store for about six years. After a nine-year spell in Durban, he returned to Barberton in 1902, and remained there for the rest of his life. Always a keen gardener, he collected many plants, including several new species which were named after him. It seems that the delightful tale that he and E.E. Galpin, another noted collector in the Transvaal at the time, bounced about the Barberton hills in a Model T Ford from one collecting site to the next, is probably apocryphal.

Vouchers: *Hardy 6373* (PRE); *Muller 2304* (PRE); *Reynolds 2460* (BOL, PRE); *Rogers 20250* (J).

66. ***Aloe pretoriensis*** *Pole Evans* in The Gardeners' Chronicle 3, 56: 106 (1914); *Pole Evans*: 32 (1915); *Pole Evans*: t. 18 (1921a); *Reynolds*: 115 (1940b); *Reynolds*: 306 (1950); *Jepp*: 10 (1969); *Bornman & D.S.Hardy*: 161 (1972); *West*: 71 (1974); *B.-E. van Wyk & G.F.Sm.*: 62 (1996). Type: Gauteng, Pretoria, *Pole Evans 12* (PRE!).

Plants caulescent; stem to 1 m tall. *Leaves* 40–60, suberect to spreading, 300–500 × 40–150 mm, glaucous green. *Inflorescence* with 5–8 branches, some of these branched, total height 2.0–3.5 m; bracts spatulate, 12–16 × 6–10 mm, many-nerved. *Flowers* pale to bright pink with bloom, 35–45 mm long; all segments free; pedicels 12–40 mm long. *Anthers* not or hardly exserted. *Ovary* 6–10 × 2–3 mm, deep



MAP 48.—*Aloe pretoriensis*

green; style exserted 1–5 mm. *Fruit* not seen. *Flowering time* May to June.

Aloe pretoriensis occurs in the Northern Province, North-West, Gauteng, Mpumalanga and Swaziland; also in Zimbabwe and on the Swaziland/Mozambique border. It grows on highveld ridges, in stony grassland. The area is mild in summer and cold in winter, with summer rain. Map 48.

With its tall inflorescence and, often, a short erect stem, *A. pretoriensis* can hardly be confused with either *A. suprafoliata* (no. 64) or *A. thorncroftii* (no. 65).

This species is named after the type locality, which is within the city boundary of Pretoria.

Vouchers: *Collins 174* (= TRV8186) (GRA, PRE); *Leendertz 618* (GRA, K, PRE); *Marloth 7334* (PRE); *Mogg 15031* (PRE); *Reynolds 3569* (PRE).

12. Section *Asperifoliae*

Section ***Asperifoliae*** (*A.Berger*) *Glen & D.S.Hardy*, stat. nov. Type species: *A. asperifolia* *A.Berger*.

Series *Asperifoliae* *A.Berger* in Botanische Jahrbücher 36: 47 (1905a); *A.Berger*: 217 (1908); *Reynolds*: 311 (1950).

Series *Hereroenses* *Reynolds*: 324 (1950). Type species: *A. hereroensis* *Engl.*

Plants solitary, or in dense groups or 'fairy rings', usually stemless. *Leaves* rosulate, lanceolate, with rough surfaces, margins dentate. *Inflorescence* simple or branched, peduncles with or without sterile bracts; racemes dense to lax, cylindric to capitate. *Flowers* cylindric to ventricose; segments connate for \pm half their length. *Anthers* long-exserted. *Style* long-exserted.

- 1a Bracts ovate to obovate, not deltoid:
 - 2a Plants pendent; inflorescence branched 74. *A. dewinteri*
 - 2b Plants erect; inflorescence simple:
 - 3a Leaves without surface prickles; flowers clavate 70. *A. claviflora*
 - 3b Leaves with few surface prickles in median line; flowers ventricose 68. *A. pachygaster*
- 1b Bracts deltoid to narrowly lanceolate-acuminate:
 - 4a Plants in dense clumps or rings:
 - 5a Inflorescence simple; bracts over 40 mm long 71. *A. argenticauda*
 - 5b Inflorescence branched; bracts up to 20 mm long:
 - 6a Flower mouth straight; inflorescence with more than 5 branches; bracts over 16 mm long; plant occurring in Namaqualand and Western Cape 69. *A. falcata*
 - 6b Flower mouth upturned; inflorescence with 2 or 3 branches; bracts up to 15 mm long; plant occurring in Namibia 67. *A. asperifolia*
 - 4b Plants solitary:
 - 7a Plants pendent 73. *A. corallina*
 - 7b Plants erect:
 - 8a Inflorescence 1.1–1.5 m tall; flowers yellowish green 75. *A. viridiflora*
 - 8b Inflorescence 0.6–1.1 m tall; flowers red or bright yellow:
 - 9a Inflorescence 2–4-branched 72. *A. namibensis*
 - 9b Inflorescence 20-branched or more 76. *A. hereroensis*

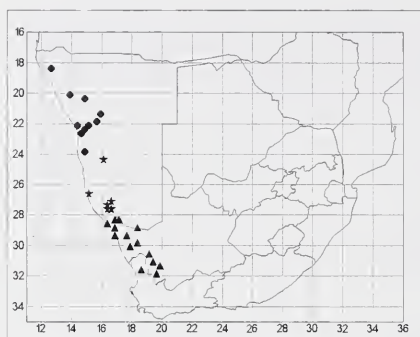
Species in this section show a series of adaptations to increasing aridity with an increasing proportion of available moisture derived from fog, not rain, starting with *A. hereroensis* and *A. viridiflora* and ending with *A. asperifolia*. The leaves are thick, leathery and rough to the touch, and are often subfalcate because of the oblique disposition of the rosettes, which may be single or clumped. The inflorescence may be simple or branched, oblique or erect, lax or dense. Flowers are cylindric, ventricose or clavate, with straight or upturned mouths and exserted anthers and styles. Bracts may be relatively small and inconspicuous to among the largest in the genus.

67. **Aloe asperifolia** A.Berger in Botanische Jahrbücher 36: 63 (1905a); A.Berger: 219 (1908); Reynolds: 312 (1950); Jeppe: 28 (1969); Sölch, Roessler & Merxm.: 16 (1970); Bornman & D.S.Hardy: 163 (1972); Jankowitz: 20 (1975); I.Verd.: t. 1753 (1978a). Type: Namibia, Zwartbankberge, *F. Stapf* 7 (Z).

Plants in solid groups of 20–40, 150–300 mm tall. *Leaves* lanceolate, erect, 150–250 \times 35–70 mm, greyish to almost white. *Inflorescence* 2- or 3-branched, oblique, 500–750 mm long; racemes sublux, cylindric; bracts deltoid-acuminate, 10–15 \times 3–4 mm, 3–5-nerved. *Flowers* scarlet, 19–28 mm long, mouth

upturned; outer segments free for 6–10 mm, inner segments dorsally adnate to outer for 12–18 mm; pedicels 5–8 mm long. *Anthers* exserted 3–10 mm. *Ovary* 6–8 \times 2–3 mm, deep olive-green; style exserted 3–10 mm. *Fruit* \pm 20 \times 13 mm, subglobose, pale grey-brown. *Flowering time* March to May.

Aloe asperifolia is endemic to northern Namibia and occurs on limestone and conglomerate in parts of the Namib Desert which are not only devoid of other plant life, but almost devoid of soil. Most of the moisture available to plants of this species is derived from fog. Map 49.



MAP 49.—● *Aloe asperifolia*
★ *A. pachygaster*
▲ *A. falcata*

This species is very similar to *A. claviflora* (no. 70). The inflorescence in this species is almost always branched, whereas in *A. claviflora* it very seldom branches, and the peduncle is much stouter in *A. asperifolia*, with much laxer racemes than in *A. claviflora*. The bracts of *A. asperifolia* are papery, not fleshy, and are much smaller than those of *A. claviflora*. The flowers of *A. asperifolia* are almost cylindric, with slightly upturned mouths, whereas those of *A. claviflora* are straight and clavate. In *A. falcata* (no. 69), which is similar in habit, the inflorescences are erect and the flowers are straight and cylindric.

The specific epithet is derived from the Latin words *asper* (= rough) and *folia* (= leaves). Microscopically, the roughness of the leaves is seen to be due to the extreme irregularity of the surface cells. This is thought to be an adaptation to the climate, in particular to provide a surface of maximum area and irregularity, so as to precipitate moisture from fog as efficiently as possible.

Vouchers: *Giess 7976* (PRE); *Hardy & De Winter 1960* (PRE); *Leach & Cannell 15063* (K, MO, PRE, SRGH); *Plowes 4453* (K, MO, SRGH); *Van Wyk 4431* (PRE).

68. *Aloe pachygaster* *Dinter* in Feddes repertorium specierum novarum regni vegeta-

bilis 19: 179 (1923a); Reynolds: 314 (1950); Jeppe: 24 (1969); Sölch, Roessler & Merxm.: 18 (1970); Bornman & D.S.Hardy: 165 (1972); Jankowitz: 16 (1975). Type: Namibia, Garub, *Dinter 4736* (B⁺). Neotype: Namibia, Grosser Tigerberg, *Jankowitz 291* (M, holo.; PRE!, WIND), designated by Merxmüller & Giess (1974).

Plants erect, in small solid groups, 200–350 mm tall. *Leaves* 25–32, lanceolate, arcuate-incurved, 100–160 × 16–30 mm, greyish yellowish green, with a median row of ± 6 black prickles at apex of lower surface. *Inflorescence* a simple, dense, subcylindric, horizontal to ascending raceme, 300–500 mm long; bracts ovate-acuminate, 16–30 × 5–18 mm, 5–8-nerved. *Flowers* cylindric to narrowly ovoid, ventricose, coral-red, 26–34 mm long, mouth slightly upturned; segments connate for ± half their length; pedicels 5–10 mm long. *Anthers* exserted 2–10 mm. *Ovary* ± 5–6 × 3 mm; style exserted 6–8 mm. *Fruit* not seen. *Flowering time* September to October.

Aloe pachygaster is endemic to Namibia south of 24° south and grows on the edge of Giess's (1971) winter-rainfall desert, on harsh dolomitic outcrops. Plants are often wedged into crevices in the rocks. Rainfall is very low indeed and erratic, but more likely in winter than in summer. Fog at night is fairly frequent. Map 49.

Plants of this species form dense groups by repeated division, with up to 10–15 rosettes in a group. The leaves are rough to the touch and convex on both surfaces, with margins armed with pungent dark brown to black teeth. The inflorescence is oblique, as in *A. claviflora* (no. 70), from which it is easily distinguishable by its differently coloured, narrower leaves, smaller rosettes and ventricose, not clavate, flowers. *A. pachygaster* flowers from September to October, whereas *A. claviflora* flowers from July to September.

The specific epithet is derived from two Greek words meaning 'fat stomach', alluding to the broadly ventricose flowers.

Vouchers: *Giess 14693* (PRE); *Hall 1878* (NBG); *Hardy 4901* (PRE); *Triebner 1628* (PRE).

69. *Aloe falcata* Baker in Journal of the Linnean Society of London, Botany 18: 181 (1880a); Baker: 326 (1896a); A.Berger: 218 (1908); Reynolds: 316 (1950); Jeppe: 27 (1969); Bornman & D.S.Hardy: 167 (1972); B.-E. van Wyk & G.F.Sm.: 80 (1996). Type: Northern Cape, Calvinia Division, *Zeyher 1678* (K, holo.!; PRE, photo.).

Plants stemless or short-stemmed, 200–400 mm tall, in solid groups. *Leaves* \pm 20, erect, lanceolate, 250–400 \times 40–70 mm, grey-green to glaucous. *Inflorescence* with 10 or more branches, erect, up to 600 mm tall; racemes subdense, subcylindric; bracts narrowly deltoid-acuminate, 16–18 \times 3–5 mm, \pm 5-nerved. *Flowers* red, rarely yellow, 21–40 mm long; mouth straight; outer segments free for 5–10 mm, inner segments free but dorsally adnate to outer for \pm two thirds of their length; pedicels 5–18 mm long, lengthening to 15–25 mm in fruit. *Anthers* exerted 5–8 mm. *Ovary* 4.0–7.0 \times 1.5–3.0 mm, green; style exerted 1–10 mm. *Fruit* 20–27 \times 8–14 mm, grey to charcoal-grey. *Flowering time* December.

Aloe falcata grows on shallow soil on rocky outcrops in some of the most arid parts of the Northern and Western Cape. Summers are hot and extremely dry, and winters are frost-free and the season in which the small amounts of rain falling in this area can be expected. Fog is frequent at night. The vegetation falls into Acocks's (1988) Succulent Karoo veld type. Map 49.

Plants of this species usually form small, dense groups of five to six rosettes. The leaves are rough to the touch, falcately upcurved and grey-green to glaucous; the upper surface is slightly channelled, but flat towards the base, and the lower surface is convex with a slight keel near the apex. This species can readily be distinguished from *A. asperifolia* (no. 67) by its

arcuate-ascending inflorescence and laxly flowered racemes which terminate in acute apices.

Falcatus is a Latin word meaning 'curved like a sickle'. In this species it refers to the peduncle, which emerges from the rosette at an angle and then, at about the level of the lowest branches, bends upwards so that the racemes are vertical.

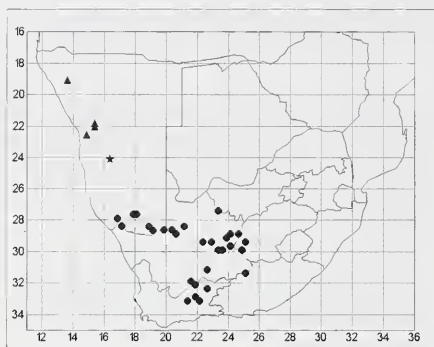
Vouchers: *Frames 252* (PRE); *Marloth 12529* (PRE, STE); *Reynolds 2537* (PRE); *Van Balen 266* (PRE); *Werdermann & Oberdieck 643* (B, K, PRE).

70. *Aloe claviflora* Burch., Travels in the interior of southern Africa 1: 272 (1822); Reynolds: 25 (1938d); McKay: 34 (1943); Reynolds: 318 (1950); Jeppe: 28 (1969); Sölch, Roessler & Merxm.: 16 (1970); Bornman & D.S.Hardy: 169 (1972); Jankowitz: 18 (1975); B.-E. van Wyk & G.F.Sm.: 78 (1996). Type: Northern Cape, Fraserburg, *Burchell 1425.2* (K).

A. schlechteri Schönland: 45 (1903); A.Berger: 219 (1908); Pole Evans: t. 151 (1924d). Type: Northern Cape, Pella, *M. Schlechter 133* (GRA, holo.!; BOL!, PRE!).

A. decora Schönland: 386 (1905b). Type: Northern Cape, Douglas, *Orpen s.n.* (GRA, holo.!; BOL!, PRE!).

Plants in 'fairy rings' of up to 100 rosettes, stemless or shortly caulescent, 150–250 mm tall. *Leaves* 30–40 per rosette, arcuate-erect, 150–200 \times 25–80 mm, glaucous. *Inflorescence* a simple, horizontal to slightly ascending, dense, narrowly conical raceme 300–500 mm long; bracts ovate-acuminate, 15–32 \times 5–10 mm, 5–many-nerved. *Flowers* coral-red in bud, pale yellow at flowering, clavate, 25–40 mm long; outer segments free for a quarter to half of their length, inner segments free but dorsally adnate to outer; pedicels 7–12 mm long. *Anthers* exerted 4–15 mm. *Ovary* 6.0–8.0 \times 1.5–3.0 mm, lemon-yellow to olive-green; style exerted 4–15 mm. *Fruit* 32–55 \times 14–22 mm, purplish grey-brown. *Flowering time* July to September.



MAP 50.—● *Aloe claviflora*
★ *A. argenticauda*
▲ *A. namibensis*

Aloe claviflora is found in southern Namibia, the western Free State, the Northern, Western and Eastern Cape and on the North-West border. It usually, but not always, occurs on calcrete, on the margins of Kalahari thornveld. It often grows in association with *Acacia mellifera* var. *detinens* and does not normally occur out of the summer-rainfall area. Map 50.

Plants of this species form dense clumps by means of offshoots from their prostrate stems or by means of (often repeated) division. As the central parts die off, the clumps may form open circles or 'fairy rings'. The leaves are rough to the touch and grey-green to glaucous. The upper surface is flat to slightly convex and the lower surface is convex. The inflorescence is usually simple, rarely branched and usually oblique to almost horizontally disposed. *A. claviflora* may be distinguished from *A. pachygaster* (no. 68) by its generally more robust habit, larger distinctly clavate flowers and differently coloured leaves. Differences between this species and *A. asperifolia* (no. 67) are discussed under that species.

The specific epithet is derived from two Latin words, *clava* (= a club) and *flos* (= a flower), and draws attention to the club-shaped flowers. Common names recorded for this species are *kraaialwyn* and *aanteelaalwyn* (Afrikaans) (Reynolds 1950).

Vouchers: *Balsinhas & Kersberg 2030* (PRE); *Dinter 4815* (PRE); *Giess 14585* (PRE); *Reynolds 1548* (PRE); *Schlieben 11570* (PRE).

Hybrids:

1. *A. claviflora* × *A. broomii* var. *broomii* (no. 26a). See *A. broomii* var. *broomii*.

2. *A. claviflora* × *A. greatheadii* var. *greatheadii* (no. 46a). See *A. greatheadii* var. *greatheadii*.

3. *A. claviflora* × *A. grandidentata* (no. 58). See *A. grandidentata*.

4. *A. claviflora* × *A. hereroensis* var. *hereroensis* (no. 76a). Vouchers: *Bryant 288* (PRE); *Coetzee & Werger 1742* (PRE); *Leistner & Joynt 2853* (PRE); *Reynolds 1558* (BM, PRE).

71. *Aloe argenticauda* Merxm. & Giess in *Mitteilungen der Botanischen Staatssammlung München* 11: 441 (1974); *Jankowitz: 14* (1975). Type: Namibia, farm *Urikos*, *Merxmüller & Giess 28216* (M. holo.; PRE!, SRGH!, WIND).

Plants stemless or short-stemmed, 300–500 mm tall excluding inflorescence, in solid clumps. *Leaves* ± 50 per rosette, erect, 250–350 × 30–35 mm, brownish grey-green, sometimes with short median row of prickles at apex of lower surface. *Inflorescence* a simple, erect, cylindric-conical, very dense raceme, 0.9–1.2 (–1.5) m tall; bracts narrowly deltoid-acuminate, 50–70 × 7–12 mm, 7–many-nerved. *Flowers* deep strawberry-pink, 32–37 mm long, cylindric-ventricose; all segments shortly connate at base; pedicels 5–12 mm long. *Anthems* exserted up to 2 mm. *Ovary* ± 6 × 2 mm; style exserted 3–6 mm. *Fruit* not seen. *Flowering time* August to October.

Aloe argenticauda occurs on very thin soil on dolomite among desert grasses on the eastern edge of the Namib Desert. Rainfall is scanty, with no seasonal maximum, and much of the moisture available to these plants is precipitated from nocturnal fog. Map 50.

The leaves of this species are much longer than those of *A. pachygaster* (no. 68), with which this species was confused for many years. The inflorescence of *A. argenteicauda* is erect, not oblique, and well over twice as long as that of *A. pachygaster*, the bracts are twice as long and the flower is significantly longer. The anthers and style are exerted much less in this species than in *A. pachygaster*.

The 'silver-tailed aloe' (Latin *argentum* = silver, and *cauda* = a tail) is very aptly named after its conspicuous silvery bracts, which enclose the young buds completely, so that the portion of the inflorescence above the opened flowers has indeed the appearance of a silver-coloured fox-tail.

Voucher: *Strey 2298* (PRE).

72. *Aloe namibensis* Giess in Mitteilungen der Botanischen Staatssammlung München 8: 123 (1970); Sölch, Roessler & Merxm.: 18 (1970); Bornman & D.S.Hardy: 285 (1972); D.S.Hardy: 518 (1974); Jankowitz: 22 (1975); I.Verd.: t. 1730 (1977). Type: Namibia, Swakopmund District, *Giess 9212* (WIND, holo.; M).

Plants stemless, erect, 0.6–1.0 m tall excluding inflorescence, usually solitary. *Leaves* 20–32, arcuate-ascending, 375–500 × 60–70 mm, glaucous. *Inflorescence* 2–4-branched from about the middle, up to ± 950 mm tall; racemes dense, cylindric; bracts narrowly deltoid-acuminate, ± 35 × 5–14 mm, 7-many-nerved. *Flowers* brilliant red, 20–30 mm long, cylindric-ventricose; outer segments free to base, inner segments free but dorsally adnate to outer in lower half; pedicels 3–5 mm long. *Anthers* exerted 3–12 mm. *Ovary* ± 7.0 × 2.5 mm, olive-green; style exerted 7–10 mm. *Fruit* not seen. *Flowering time* November to March. Figure 12.

Aloe namibensis occurs on the edge of the central Namib Desert, north of the main road between Windhoek and Swakopmund. It does not penetrate into such harsh areas as *A. asperi-*

folia (no. 67). The scanty rainfall mostly occurs in summer. Fog occurs at night at all times of the year. Map 50.

The blue-green leaves of this species indicate a similarity to *A. claviflora* (no. 70), but the erect inflorescence indicates one to *A. argenteicauda* (no. 71). The inflorescence in this species is much longer than that of *A. claviflora* and nearly as long as that of *A. argenteicauda*, but it is branched, and the bracts are much shorter and less conspicuous than in that species. In *A. claviflora* the inflorescence may be simple or branched, and the bracts are smaller than in *A. namibensis*.

This species is named after the Namib Desert, its natural habitat.

Voucher: *Giess 10459* (PRE).

73. *Aloe corallina* I.Verd. in The Flowering Plants of Africa 45: t. 1788 (1979). Type: Namibia, Otjomboerombonga, *Leistner et al.* 179 (PRE, holo.).

Plants solitary, pendent, short-stemmed, ± 500 mm tall excluding inflorescence. *Leaves* 16–20, spreading to slightly recurved, brownish green, 400–500 × 80–110 mm. *Inflorescence* 2–4-branched from about the middle, arcuate-ascending to arcuate-erect, ± 600 mm long; racemes narrowly conical, dense; bracts deltoid-acuminate, ± 10–15 × 4 mm, ± 7-nerved. *Flowers* coral-red to brilliant scarlet, 28–35 mm long; segments connate for 10–12 mm. *Anthers* not or hardly exerted. *Ovary* ± 7 × 2 mm, pale green; style exerted up to 5 mm. *Fruit* ± 12 × 5 mm, dark brown to dark greenish grey. *Flowering time* July to August.

Aloe corallina occurs on very steep cliffs in the mountains of the Kaokoveld. Rainfall in this area is minimal, and occurs mostly in summer. Fog may occur at any time of the year, but this, too, is rare here. The cliffs where *A. corallina* grows are so steep as to preclude the presence of other vegetation. Map 51.

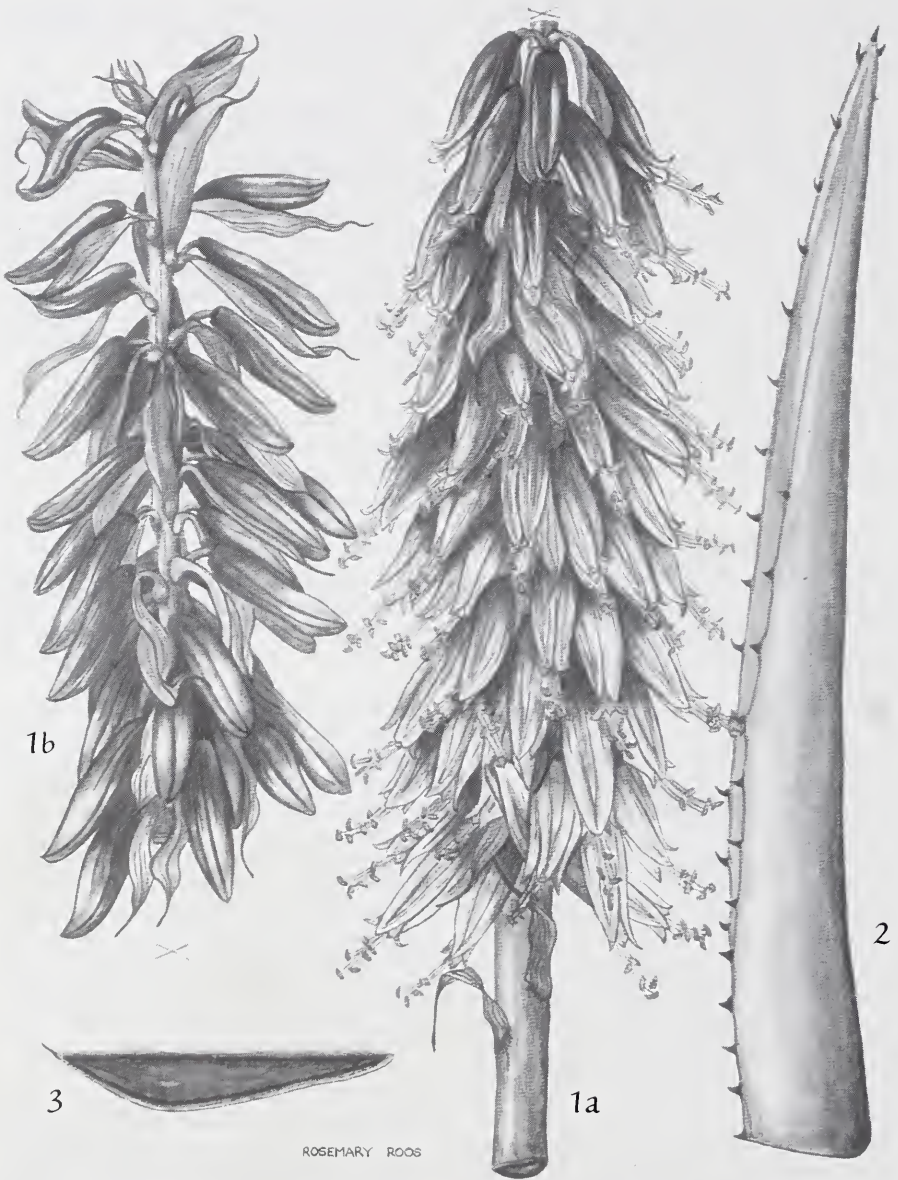
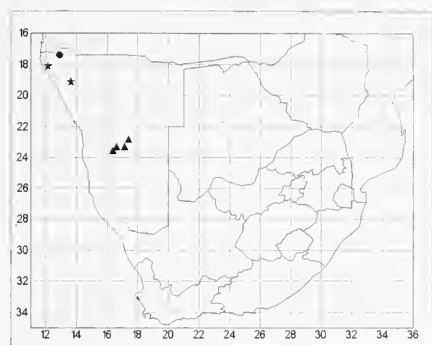


FIGURE 12.—Section *Asperifoliae*. *Aloe namibensis*: 1a, lower half of raceme; 1b, upper half of raceme; 2, upper half of leaf; 3, cross section of leaf, about midway. Taken from Verdoorn (1977).



MAP 51.—● *Aloe corallina*
★ *A. dewinteri*
▲ *A. viridiflora*

Aloe mendesii, with which this species has been confused, is an Angolan species with a pendent habit on cliff faces, not erect. The leaves of *A. corallina* are leathery, with hard spines, whereas those of *A. mendesii* are much softer, with softer spines. The inflorescence of *A. corallina* is usually branched, whereas that of *A. mendesii* is simple. The anthers and style of *A. corallina* are not exserted as far as those of *A. mendesii*, and the perianth segments are free for two thirds, not half, of their length. There are also considerable microscopical differences in the leaf surface between these two species. In *A. dewinteri* (no. 74), the inflorescence is branched in the lower half, and the branches ascend at an angle to the main axis, whereas the inflorescence of *A. corallina* is branched in the upper half, and the branches are roughly parallel to the main axis. The racemes of *A. corallina* are sub-lax and conical, not dense and cylindric, and the flowers do not change colour from bud to flowering.

As the specific epithet indicates, the flowers of this species are coral-red.

Voucher: *Leistner et al.* 179 (PRE).

74. *Aloe dewinteri* *Giess* in *Bothalia* 11: 120 (1973); *Bornman & D.S.Hardy*: 287 (1972)

without Latin description; *D.S.Hardy*: 521 (1974); *Jankowitz*: 34 (1975); *I.Verd.*: t. 1752 (1978b). Type: Namibia, Sesfontein, *Bulr sub Giess 10990* (WIND, holo.; M, PRE!).

Plants solitary, pendent, stemless or short-stemmed, ± 500 mm tall excluding inflorescence. Leaves 14–22, glaucous to grey-green, 350–500 \times 90–150 mm, apices recurved, margins red. Inflorescence rarely simple, usually 2–4-branched near base, to 850 mm tall; racemes dense, cylindric-conical; bracts oblong-obovate, acuminate, 12–18 \times 5–7 mm, \pm 7-nerved. Flowers scarlet in bud, creamy yellow at flowering, cylindric-trigonous, 23–33 mm long; outer segments free for two thirds to three quarters of their length, inner segments free but dorsally adnate to outer; pedicels 3–5 mm long. Anthers exserted for 1–6 mm. Ovary 5–6 \times 2–3 mm, green; style exserted for 1–4 mm. Fruit not seen. Flowering time December to January.

Aloe dewinteri is endemic to Namibia, growing on steep cliff faces a relatively short distance to the south of *A. corallina* (no. 73). This is a very arid area with hardly any (summer) rainfall and minimal moisture from fog. Map 51.

Differences between this species and *A. corallina* are dealt with under that species. It would be difficult to confuse this species with any other southern African aloe, but it bears a superficial similarity to *A. niebuhriana*, an Arabian species.

This species is named after Dr B. de Winter, a former Director of the Botanical Research Institute, who collected one of the first plants from which the description was made.

Voucher: *De Winter & Leistner* PRE38580 (PRE).

75. *Aloe viridiflora* *Reynolds* in *Journal of South African Botany* 3: 143 (1937b); *Reynolds*: 322 (1950); *I.Verd. & D.S.Hardy*: t. 1598 (1969);

Jeppe: 30 (1969); Sölch, Roessler & Merxm.: 19 (1970); Bornman & D.S.Hardy: 171 (1972); Jankowitz: 32 (1975). Type: Namibia, Windhoek District, *Reynolds 1626* (PRE!).

Plants solitary, stemless, erect, 500–700 mm tall excluding inflorescence. *Leaves* 50–60, arcuate-incurved, 300–600 × 40–80 mm, brownish glaucous, faintly lined. *Inflorescence* 5–10-branched, 1.2–1.5 m tall; racemes very dense, capitate; bracts deltoid-acuminate, 12–15 × 4–7 mm, 5–9-nerved. *Flowers* green to lemon-yellow, 21–33 mm long; all segments free almost to base; pedicels 10–20 mm long. *Anthers* exserted 5–10 mm. *Ovary* 5.0–9.0 × 2.0–2.5 mm, green; style exserted 5–12 mm. *Fruit* not seen. *Flowering time* August to September.

Aloe viridiflora grows near Windhoek, a few kilometres east of nearby populations of *A. hereroensis* (no. 76). *A. viridiflora*, unlike *A. hereroensis*, usually occurs on granite. Map 51.

Plants of this species are solitary and stemless. The leaves are glaucous without spots but very faintly lined. The lower surface is convex, and the margins are armed with deltoid pungent pinkish brown teeth. The inflorescence is a many-branched panicle with dense capitate racemes, erect and up to ± 1.5 m tall. This species differs from all others in the genus except *A. inconspicua* (no. 7) in having green flowers. In that species all vegetative characters, as well as the inflorescence and flower shape, are markedly different from those of this species.

The remarkable green flowers give this species its name (Latin *viridis* = green, and *flos* = flower).

Vouchers: *Giess 13457* (MO, WIND); *Hall NBG 419/55* (NGB); *Hardy 2287* (PRE); *Strey 2633* (PRE).

76. *Aloe hereroensis* Engl. in *Botanische Jahrbücher* 10: 2 (1888); Baker: 462 (1898a); A.Berger: 204 (1908); Reynolds: 324 (1950);

Reynolds: 100 (1966); Jeppe: 31 (1969); Sölch, Roessler & Merxm.: 17 (1970); Bornman & D.S.Hardy: 173 (1972); Jankowitz: 30 (1975); B.-E. van Wyk & G.F.Sm.: 142 (1996). Type: Namibia, Usakos, *Marloth 1438* (B, holo.; PRE!).

A. orpeniae Schönland: 385 (1905b). *A. hereroensis* Engl. var. *orpeniae* (Schönland) A.Berger: 204 (1908); Pole Evans: t. 281 (1928d). Type: Northern Cape, Douglas, *Orpen s.n.* (GRA, holo.!; BOL!, PRE!).

Plants solitary, stemless or short-stemmed, erect, 300–500 mm tall excluding inflorescence. *Leaves* ± 30, arcuate-ascending, 250–325 × 35–85 mm, shallowly channelled to D-shaped in section, grey-green, dark blue-green or reddish brown, obscurely lined, often with many H-shaped whitish spots. *Inflorescence* a panicle with 20 or more branches, ± 1 m tall; racemes dense, capitate; bracts narrowly lanceolate-acuminate, 15–30 × 5–6 mm, 3–7-nerved. *Flowers* usually scarlet to deep red, almost magenta, rarely yellow, 25–35 mm long; pedicels 18–50 mm long. *Anthers* exserted 2–5 mm. *Ovary* 7–8 × 2–3 mm, green; style exserted 5–10 mm. *Fruit* ± 18 × 7 mm, buff. *Seeds* ± 2.0 × 1.25 × 0.75 mm, almost black, wings prominent, buff. *Flowering time* June to September.

Two varieties are recognised:

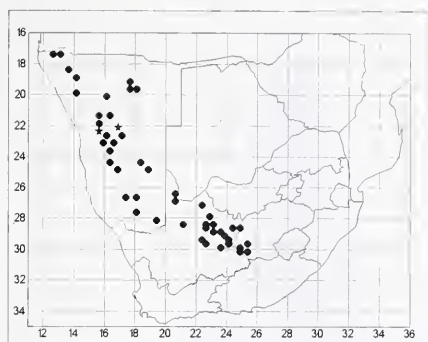
Flowers red 76a. var. *hereroensis*
Flowers yellow 76b. var. *lutea*

76a. var. **hereroensis**.

Description as for species.

This very widespread variety is found in Namibia, the Northern Cape and western Free State; also in Angola. It usually grows on quartzite, but has been found on dolomite in the Kalahari. It is confined to the summer-rainfall area. Map 52.

Although *A. hereroensis* superficially resembles *A. viridiflora* (no. 75), it can hardly be confused with that species. The very distinct striations or spots on the leaves, which are characteristic of this species, are absent in *A. viridi-*



MAP 52.—● *Aloe hereroensis* var. *hereroensis*
★ *A. hereroensis* var. *lutea*

flora. The flower of *A. hereroensis* is campanulate-cylindric with upturned mouth and usually slightly stipitate, while in *A. viridiflora* it is approximately cylindric. The flowers of *A. hereroensis* vary from red to yellow, and are never green as in *A. viridiflora*.

The specific epithet indicates that this species grows in that part of central Namibia that was called Hereroland in German colonial times.

Vouchers: *Dinter* 4921 (PRE); *Giess* 15288 (PRE); *Leistner* 904 (PRE); *MacDonald* 140 (NBG, PRE); *Reynolds* 2525 (PRE).

Hybrids:

1. *A. hereroensis* var. *hereroensis* × *A. broomii* var. *broomii* (no. 26a). See *A. broomii* var. *broomii*.

2. *A. hereroensis* var. *hereroensis* × *A. variegata* (no. 40). See *A. variegata*.

3. *A. hereroensis* var. *hereroensis* × *A. greatheadii* var. *greatheadii* (no. 46a). See *A. greatheadii* var. *greatheadii*.

4. *A. hereroensis* var. *hereroensis* × *A. grandidentata* (no. 58). See *A. grandidentata*.

5. *A. hereroensis* var. *hereroensis* × *A. claviflora* (no. 70). See *A. claviflora*.

76b. var. **lutea** *A. Berger* in *Das Pflanzenreich* 33: 205 (1908); Reynolds: 326 (1950); Jeppe: 31 (1969); Bornman & D.S.Hardy: 173 (1972). Type: Namibia, between Karibib and Kubas, *Dinter s.n.* (B?—not traced).

Differs from the typical variety only in having yellow, not red, flowers.

Endemic to Namibia. Map 52.

Although the difference in appearance between variety and type is so small, this variety is upheld because the two are not sympatric. The distribution range of var. *lutea* is completely within that of var. *hereroensis*, and the nearest populations of each variety are not far from each other. The varietal epithet refers to the yellow flowers.

Vouchers: *Dinter* 199 (BM, K, SAM); *Seydel* 288 (K, MO).

13. Section **Latebracteatae**

Section **Latebracteatae** (*A. Berger*) *Glen & D.S.Hardy*, stat. nov. Type species: *A. cryptopoda* Baker.

Series *Latebracteatae* *A. Berger* in *Das Pflanzenreich* 33: 232 (1908); Christian: 117 (1940a); Reynolds: 330 (1950).

Plants stemless to short-stemmed, sometimes suckering. *Leaves* rosulate, ensiform, not lined or spotted, margins dentate. *Inflorescence* 2–8-branched, sterile bracts only subtending inflorescence branches, or few, below racemes; racemes conical. *Flowers* cylindric-trigonous, red to yellow; outer perianth segments free. *Anthers* not or shortly exserted. *Style* not or shortly exserted.



FIGURE 13.—Section Latebracteatae. *Aloe cryptopoda*: 1, habit, much reduced; 2, raceme; 3, portion of leaf; 4, transverse section of leaf; 5, bract; 6, open flower; 7, fruit showing remains of perianth attached. Taken from Pole Evans (1922b).

Leaves yellowish green; inflorescence usually 3-branched; bracts 7-nerved 78. *A. lutescens*
 Leaves deep green; inflorescence 5–8-branched; bracts many-nerved 77. *A. cryptopoda*

In habit and general appearance, the species of this section are similar to those of section 22, *Pachythamnos*. The bracts in this section are much larger and particularly much wider than those of section *Pachythamnos*. Flowers in this section are borne on longer pedicels (10–20 mm, not 2–8 mm), and have included or only shortly exserted anthers and styles.

77. *Aloe cryptopoda* Baker in Journal of Botany, British and Foreign 22: 52 (1884); Baker: 467 (1898a); A. Berger: 233 (1908); Christian: 117 (1940a); Reynolds: 331 (1950); Reynolds: 31 (1954); Reynolds: 181 (1966); Jeppe: 60 (1969); Bornman & D.S. Hardy: 179 (1972); West: 65 (1974); Compton: 99 (1976); B.-E. van Wyk & G.F. Sm.: 132 (1996). Type: Mozambique, Mutarara, Kirk 96 (K, holo.; PRE!, photo.).

A. pienaarii Pole Evans: 27 (1915); Pole Evans: t. 17 (1921b). Type: Northern Province, Smits Drift, *Pienaar s.n.* (PRE!).

A. wickensii Pole Evans: 29 (1915); Pole Evans: t. 41 (1922b); Reynolds: 146 (1937b) pro parte; Reynolds: 334 (1950); Jeppe: 62 (1969); Bornman & D.S. Hardy: 181 (1972). Lectotype: hort., *Curator Pretoria* 122 (PRE!).

A. wickensii Pole Evans var. *lutea* Reynolds: 145 (1937b); Reynolds: 335 (1950); Jeppe: 62 (1969); Bornman & D.S. Hardy: 181 (1972). Type: Mpumalanga, Burgersfort, *Reynolds* 1949 (PRE, holo.; BOL!, UPS!).

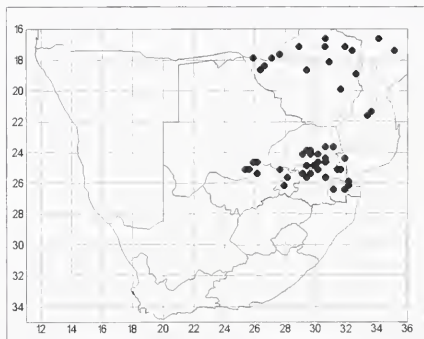
Plants usually stemless, 500–800 mm tall excluding inflorescence, not suckering. *Leaves* 40–50, erect to arcuate-erect, 400–900 × 40–150 mm, deep green to glaucous green. *Inflorescence* 5–8-branched, 1.25–1.75 m tall; racemes subdense; sterile bracts few; bracts broadly ovate-acuminate, 13–20 × 8–12 mm, many-nerved. *Flowers* red, yellow, or red in bud and yellow at flowering, 25–45 mm long; all segments free; pedicels 8–20 mm long. *Anthers* exserted 1–4 mm. *Ovary* 6.0–9.0 × 2.5–4.0 mm, green; style exserted 3–5 mm. *Fruit* 20–23 × 11–13 mm, buff-grey. *Seeds* grey, ± 5 × 4 × 1 mm, wing moderately narrow, translucent. *Flowering time* June to August in most populations, but February to March in some. Figure 13.

Aloe cryptopoda is found in Botswana, the Northern Province, North-West, Gauteng, Mpu-

malanga and Swaziland; also in Malawi, Mozambique and Zimbabwe. It occurs in open savanna woodland, in areas of summer rain and light to no frost. It is widespread and does not seem to be soil-specific. Seedlings of populations flowering from February to March have leaves covered with hard, brown tubercles which disappear with age, and which are not found in seedlings of winter-flowering populations. Map 53.

The leaves of plants of this species turn brownish when under drought stress, while those of *A. lutescens* (no. 78) turn yellowish. *A. cryptopoda* is not stoloniferous, as *A. lutescens* is. The inflorescence of *A. cryptopoda* is more broadly conical than that of *A. lutescens*, and the flowers are slightly clavate, not cylindric.

The specific epithet, derived from two Greek words meaning 'hidden foot', refers to the pedicels which are largely (certainly in the basal portion) hidden by the bracts. In seKone, the common name of this species is *ngafane* (Reynolds 1950).



MAP 53.—*Aloe cryptopoda*

Vouchers: *Buitendag* 836 (NBG, PRE); *Codd* 2962 (PRE); *Marloth* 5140 (PRE, STE); *Reynolds* 1945 (BOL, PRE); *Van der Schijff* 3006 (PRE).

Hybrids:

1. *A. cryptopoda* × *A. greatheadii* var. *davyana* (no. 46b). See *A. greatheadii* var. *davyana*.

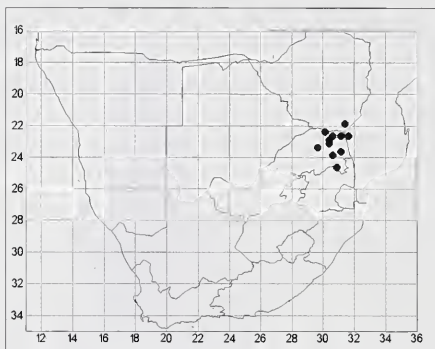
2. *A. cryptopoda* × *A. arborescens* (no. 96). Voucher: *Leach* 353 (SRGH).

3. *A. cryptopoda* × *A. castanea* (no. 102). Voucher: *Barnard s.n.* (PRE).

4. *A. cryptopoda* × *A. marlothii* subsp. *marlothii* (no. 104a). Voucher: *Barnard* 1134 (PRE).

78. ***Aloe lutescens* Groenew. ex Pole Evans** in *The Flowering Plants of South Africa* 18: t. 707 (1938c); *Reynolds*: 337 (1950); *Jeppe*: 60 (1969); *Bornman & D.S.Hardy*: 183 (1972); *West*: 66 (1974); *B.-E. van Wyk & G.F.Sm.*: 146 (1996). Type: Northern Province, Tshipise, *F.Z. van der Merwe* 1377 (PRE!).

Plants short-stemmed, 500–800 mm tall excluding inflorescence, sometimes suckering to form lax to dense groups. *Leaves* ± 30, arcuate-erect to spreading, 400–600 × 60–90 mm, yellowish green. *Inflorescence* usually 3-branched; sterile bracts only subtending branches; racemes dense; bracts broadly ovate-acuminate, 10–15 × 5–15 mm, ± 7-nerved. *Flowers* scarlet in bud, yellow at flowering, 23–35 mm long; all segments free; pedicels 13–15 mm long, lengthening to 17–25 mm in fruit. *Anthers* exerted up to 3 mm. *Ovary* 5–8 × 2–4 mm, green; style exert-



MAP 54.—*Aloe lutescens*

ed 2–6 mm. *Fruit* 16–30 × 12–15 mm, grey to reddish. *Flowering time* July to August.

Aloe lutescens grows in hot savanna woodland in the Northern Province; also in Mozambique and Zimbabwe. It grows in very sandy soils and sometimes on calcrete. Nowhere in its distribution range does it encounter frost or high rainfall. Map 54.

In this species the leaves turn yellowish when drought-stricken, rather than reddish or brownish as in *A. cryptopoda* (no. 77). Other differences between this species and *A. cryptopoda* are discussed under that species.

The Latin word *lutescens* may be translated as 'becoming yellow' or 'yellowish'. The former meaning describes the flowers, and the latter fits the leaves.

Vouchers: *Galpin* 13200 (PRE); *Plowes* 2590 (NH, PRE); *Reynolds* 2509 (PRE); *Van der Schijff* 3183 (PRE).

14. Section **Chabaudia**

Section **Chabaudia** *Glen & D.S.Hardy*, sect. nov. Type species: *A. chabaudii* Schönland.

Series *Aethiopicae* A.Berger in *Das Pflanzenreich* 33: 242 (1908); *Reynolds*: 339 (1950) pro parte, excl. typ. Type species: *A. aethiopica* (Schweinf.) A.Berger.

Plantae solitariae vel soboliferae, acaulescentes vel breve caulescentes; foliis immaculatis vel obscure lineatis vel maculatis, marginibus grosse vel subtiliter dentatis; inflorescentiis ramosis, in *A. suffulta* scandentibus; perianthio trigonose indentato; antheris styloque inclusis vel breve exsertis.

Plants stemless to short-stemmed, often suckering freely. *Leaves* rosulate, deltoid to ensiform, obscurely lined, often spotted, sometimes unmarked, shallowly channelled, margins dentate. *Inflorescence* usually much-branched, erect, sometimes climbing; sterile bracts only subtending inflorescence branches; racemes capitate to cylindric, dense to lax; pedicels half as long as flowers; bracts small, deltoid-acuminate. *Flowers* with a basal swelling enclosing ovary, later trigonously indented, straight to arcuate-decurved, usually red; outer segments connate for half or more of their length. *Anthers* included to shortly exserted. *Style* included to shortly exserted.

Leaves distinctly spotted; inflorescence climbing 79. *A. suffulta*
 Leaves unspotted, rarely obscurely spotted; inflorescence erect (self-supporting) . . 80. *A. chabaudii*

The trigonous indentations in the flower above the ovary distinguish this group from all others. Plants are solitary or clumped, with unspotted to distinctly randomly spotted leaves. The inflorescences are much-branched panicles with lax to dense racemes, and may twine around surrounding bushes for support. The following species, both occurring only in tropical Africa, are to be placed in this section: *A. bukobana* and *A. rivaie*. The type of Berger's series *Aethiopicae*, *A. aethiopica* (Schweinf.) A. Berger (a synonym of *A. elegans* Tod.) is excluded. This species is closer to section 13, *Latebracteatae*. Some species from East Africa with randomly spotted leaves and subtrigonous flowers, such as *A. pirottae* and *A. somaliensis*, quite probably belong here. *A. suffulta* seems to be intermediate between these species and those listed above, which are more similar to *A. chabaudii* than *A. pirottae*.

79. ***Aloe suffulta* Reynolds** in Journal of South African Botany 3: 151 (1937d); Reynolds: 343 (1950); Jeppe: 103 (1969); Bornman & D.S. Hardy: 187 (1972); West: 63 (1974); B.-E. van Wyk & G.F. Sm.: 222 (1996). Type: Mozambique, Marracuene, Reynolds 2457 (PRE, holo.; BOL!).

Plants solitary, short-stemmed; stems up to 200 mm long with distinct internodes. *Leaves* ± 16, sheathing at base, blade narrowly deltoid, spreading to recurved, 300–500 × 20–40 mm, green with many dull white spots. *Inflorescence* a climbing panicle, 1.75–2.25 m long; racemes lax, cylindric; bracts deltoid, 5–7 × 2–4 mm, ± 7-nerved. *Flowers* reddish, mouth whitish, 18–35 mm long; outer segments free for 3–7 mm, inner segments mostly dorsally adnate to outer; pedicels 5–9 mm long. *Anthers* exserted 1–6 mm. *Ovary* 5.0–6.0 × 2.0–3.5 mm, green;

style exserted 1–8 mm. *Fruit* not seen. *Flowering time* June to July.

The type locality of this species is in thorny scrub on consolidated beach dunes. It occurs on sand with loose humus or on black cotton soil in very hot places in KwaZulu-Natal; also in Mozambique and Zimbabwe. It is very susceptible to cold. Map 55.

Plants of *A. suffulta*, unlike those of *A. chabaudii* (no. 80), are climbing and solitary, with distinct internodes between the copiously spotted recurved leaves. The inflorescence is 1.5–2.25 m tall and climbing, as the peduncle is too thin to support itself. This species is one of the most distinctive in the whole genus.

This specific epithet is derived from the Latin word *suffulcire*, meaning to 'prop up' or 'sup-

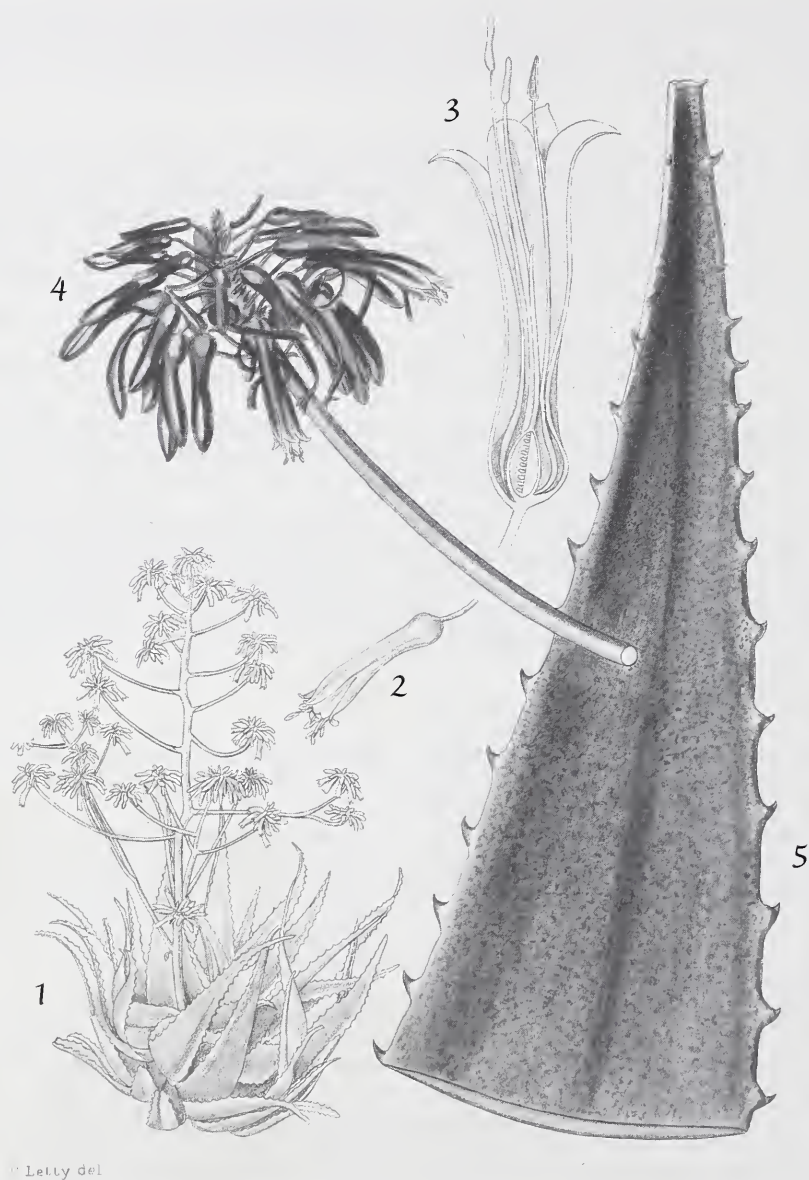
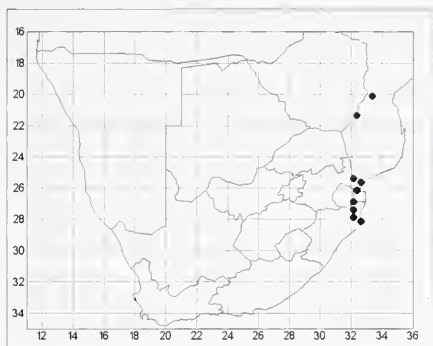


FIGURE 14.—Section *Chabaudia*. *Aloe chabaudii*. 1, habit, much reduced; 2, single flower; 3, median longitudinal section of flower; 4, inflorescence; 5, upper part of leaf. Taken from Christian (1938b).

MAP 55.—*Aloe suffulta*

port'. The inflorescence of this species is supported by the bushes between which it grows.

Vouchers: *Harrison PRE39405* (PRE); *Leach & Brunton 1193* (PRE); *Pooley 1658* (NU); *Strey 10409* (NH, PRE).

80. *Aloe chabaudii* Schönland in The Gardeners' Chronicle 3, 38: 102 (1905c); A. Berger: 244 (1908); Pole Evans: t. 164 (1925a); Reynolds: 339 (1950); Reynolds: 23 (1954); Reynolds: 102 (1966); Jeppe: 6 (1969); Bornman & D.S. Hardy: 185 (1972); West: 53 (1974); B.-E. van Wyk & G.F. Sm.: 128 (1996). Type: Zimbabwe, no precise locality, *Schönland s.n.* (GRA!).

A. chabaudii Schönland var. *verekeri* Christian: t. 699 (1938b); Reynolds: 342 (1950); Reynolds: 107 (1966); West: 62 (1974). Type: Zimbabwe, Sabi Gorge, *Vereker PRE23027* (PRE!).

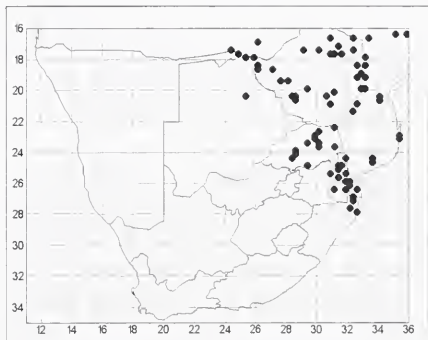
Plants stemless or short-stemmed, 300–500 mm tall excluding inflorescence, forming large dense groups. *Leaves* ± 20 per rosette, biconvex, 300–500 \times 60–110 mm, grey-green to glaucous green, upper surface sometimes with few spots. *Inflorescence* a panicle 0.6–1.0 m tall; racemes capitate to cylindric, lax to subdense; bracts deltoid, 3.0–5.0 \times 1.5–3.0 mm, 3–5-nerved. *Flowers* scarlet to brick-red, 18–40 mm long; outer segments free for 4–8 mm, inner segments free but dorsally adnate to outer;

pedicels 19–25 mm long. *Anthers* exerted 1–2 mm. *Ovary* 6.0–7.0 \times 2.0–2.5 mm, brownish green; style exerted 2–4 mm. *Fruit* $\pm 21 \times 12$ mm. *Flowering time* June to July. Figure 14.

Found in Botswana, the Northern Province, Mpumalanga, Swaziland and KwaZulu-Natal; also in Democratic Republic of the Congo, Tanzania, Zambia, Malawi, Mozambique and Zimbabwe. *A. chabaudii* var. *mlanjeana* is restricted to Malawi and therefore not treated here. *A. chabaudii* usually grows on bare rock on granitic domes, or in shallow soil pockets. It is very variable in climatic requirements, but it is frost-sensitive. Map 56.

The leaves of this species are sometimes spotted, but the flowers lack the inflated flower base which is characteristic of section 9, *Pictae*. Instead, the flower tube is trigonously indented near the base. The nearest relatives of *A. chabaudii* are probably *A. milne-redheadii* and *A. mzimbaana*, both of which occur in northern Zambia and Malawi. *A. chabaudii* is at once distinguished from *A. suffulta* (no. 79) by its stoloniferous habit, usually unspotted or only obscurely spotted, spreading to incurved leaves and relatively short (up to 1 m tall) nonclimbing inflorescence.

The type specimen of this species was given to Schönland by Mr J.A. Chabaud, after whom

MAP 56.—*Aloe chabaudii*

it is named. Mr Chabaud grew the plant in his garden in Port Elizabeth, and had obtained it from Mr J.M. Brown, who collected it in the course of a hunting trip to the Zambezi.

5468 (BOL, PRE, SAM); *Van der Schijff* 509 (PRE).

Hybrid:

Vouchers: *Codd* 2901 (PRE); *Compton* 29052 (NBG, PRE); *Galpin* 13201 (PRE); *Reynolds*

A. chabaudii var. *chabaudii* × *A. excelsa* (no. 115). Voucher: *Leach* 9292 (SRGH).

15. Section **Macrifoliae**

Section **Macrifoliae** (Haw.) Glen & D.S.Hardy, stat. nov. Type species: *A. ciliaris* Haw.

Series *Macrifoliae* Haw. in the Philosophical Magazine 66: 280 (1825); A.Berger: 254 (1908); Reynolds: 345 (1950).

Series *Striatulae* A.Berger: 47 (1905a).

Plants shrubby or climbing, several-stemmed. *Leaves* spirally arranged, sheathing, separated by distinct internodes, linear-lanceolate, thin, flat, margins dentate to denticulate, ciliate in one species. *Inflorescence* a lateral panicle with simple, cylindric, lax to subdense or capitate and dense racemes; sterile bracts few; flowers pendulous. *Flowers* cylindric, slightly trigonous, sometimes subventricose or with a constriction about the middle; segments ± connate. *Anthers* included or exserted. *Style* included or exserted.

- 1a Sheathing leaf bases auriculate and ciliate 82. *A. ciliaris*
- 1b Sheathing leaf bases not auriculate or ciliate:
 - 2a Floriferous part of raceme shorter than 90 mm, capitate 84. *A. commixta*
 - 2b Floriferous part of raceme longer than 90 mm, subdense or lax but not capitate:
 - 3a Pedicels longer than 6 mm 83. *A. gracilis*
 - 3b Pedicels up to 6 mm long:
 - 4a Flower up to 20 mm long 81. *A. tenuior*
 - 4b Flower longer than 30 mm 85. *A. striatula*

The cane-like stems of plants of this section, with their thin, slender, sheathing unspotted and generally nonstriate leaves with minute marginal teeth, immediately distinguish this section from all others. The flowers of plants of this section are unusual in that although the outer perianth segments are connate almost to the apex, the inner segments are free to the base, not only from one another, but from the outer segments as well.

81. *Aloe tenuior* Haw. in The Philosophical Magazine 66: 281 (1825); Salm-Dyck: 25, t. 3 (1840); Baker: 317 (1896a); A.Berger: 257 (1908); Marloth: t. 23 (1915); Reynolds: 105 (1936i); Reynolds: 347 (1950); I.Verd.: t. 1352 (1961b); Jeppe: 111 (1969); Bornman & D.S.Hardy: 189 (1972); B.-E. van Wyk & G.F.Sm.: 102 (1996). Iconotype: Bauer plate at K, reproduced in Reynolds: 347 (1950).

A. tenuior Haw. var. *glaucescens* Zahlbr.: 16 (1900). Type: Eastern Cape, Kei River, *Krook* in *Penther* 780 (W).

A. tenuior Haw. var. *rubriflora* Reynolds: 108 (1936i); Reynolds: 350 (1950); Jeppe: 111 (1969); Bornman & D.S.Hardy: 189 (1972). Type: Eastern Cape, Mlangana, *Reynolds* 1750 (PRE!).

A. tenuior Haw. var. *decidua* Reynolds: 111 (1936i); Reynolds: 351 (1950); Jeppe: 111 (1969); Bornman & D.S.Hardy: 189 (1972). Type: Eastern Cape, Alice, *Reynolds* 1760 (PRE, holo.; BOL!).

A. tenuior Haw. var. *densiflora* Reynolds: 349 (1950); Jeppe: 111 (1969); Bornman & D.S.Hardy: 189 (1972). Type: Eastern Cape, Breakfast Vlei, Reynolds 2390 (PRE!).

Plants 1–3 m tall; stems leafless below lax apical tuft of leaves. *Leaves* \pm 12–20 per stem, erect to spreading, thin to slightly fleshy, 100–190 \times 10–18 mm, glaucous green. *Inflorescence* a simple, sublux to subdense raceme, 250–400 mm long; bracts narrowly deltoid-acuminate, 3–7 \times 1–2 mm, obscurely nerved. *Flowers* lemon-yellow to scarlet, cylindric, 10–19 mm long, mouth slightly expanded; outer segments mostly connate, inner segments free; pedicels 2–6 mm long, scarcely longer in fruit. *Anthers* exerted 2–6 mm. *Ovary* \pm 3.0 \times 1.0–1.5 mm, lemon; style exerted 3–6 mm. *Fruit* 10–13 \times 6–7 mm, dark brown to dark grey. *Flowering time* (August to) October to December (to May). Figure 15.

This species is found in Mpumalanga, KwaZulu-Natal and the Eastern and Western Cape and occurs in open country on sandy soil with *Encephalartos longifolius*, grasses, forbs, various members of the Mesembryanthemaceae and other small succulents. It rarely occurs in valley bushveld. Map 57.

Aloe tenuior has a large, subtuberosus to subwoody rootstock. This species differs from *A. ciliaris* (no. 82) in that the leaf bases are not at all auriculate, and the anthers and style are

long-exserted. The flowers of *A. tenuior* are somewhat smaller than those of *A. ciliaris*. In *A. striatula* (no. 85) the racemes are dense, and the flowers are decurved and about twice as long as those of *A. tenuior*.

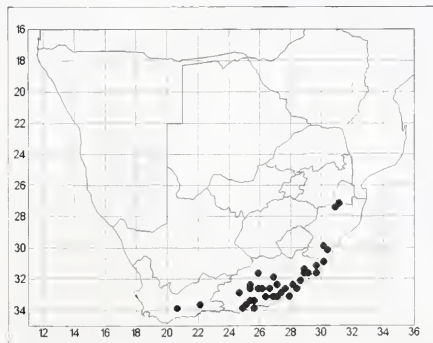
Haworth (1825) gave the English trivial name 'green-sheathed narrow-leaved (aloe)' to this species; the specific epithet indicates that it is in all parts a finer, more slender plant than *A. striatula* and *A. ciliaris*, which he described in the same paper. Other common names recorded for this species include *ikhalele* (Xhosa) and *intelezi* (Fingo) (Reynolds 1950). In folk medicine, a decoction of the roots of this species is used as a remedy for tapeworm (Reynolds 1950).

Vouchers: *Acocks* 11882 (PRE); *Bayliss* 1271 (PRE); *Plowes* 3167 (PRE); *Strey* 9620 (PRE); *Wells* 2632 (PRE).

82. *Aloe ciliaris* Haw. in The Philosophical Magazine 66: 281 (1825); Salm-Dyck: 25, t. 1 (1837); Baker: 317 (1896a); A.Berger: 255 (1908); Marloth: t. 23 (1915); R.A.Dyer: t. 910 (1943); Reynolds: 352 (1950); Jeppe: 110 (1969); Bornman & D.S.Hardy: 191 (1972); B.-E. van Wyk & G.F.Sm.: 94 (1996). Iconotype: unpublished Duncanson plate at K.

A. ciliaris Haw. var. *flanagani* Schönland: 42 (1903). Type: Eastern Cape, Komga, *Flanagan* 1326 (GRA, holo.!; BOL!, PRE!).

Stems shrubby or climbing, up to 5 m long; leaves present only near apex. *Leaves* 30–60, spreading, distinctly auriculate, usually ciliate at base, linear-lanceolate, 70–180 \times 12–25 mm, thin to slightly fleshy, glaucous. *Inflorescence* a simple, cylindric, dense raceme, 200–400 mm long; bracts narrowly deltoid-acuminate, 3–5 \times 1–2 mm, 1–3-nerved; pedicels 4–8 mm long. *Flowers* scarlet, cylindric, 25–40 mm long; outer segments free for 5–7 mm, inner segments free. *Anthers* exerted 2–4 mm. *Ovary* \pm 4–5 \times 2 mm, pale green; style exerted 2–4 mm. *Fruit* \pm 18 \times 9 mm.



MAP 57.—*Aloe tenuior*



FIGURE 15.—Section *Macrifoliae*. *Aloe tenuior*: 1, raceme; 2, terminal portion of stem with leaves and basal half of peduncle in axil of a leaf; 3, longitudinal section of flower, $\times 1.7$; 4, portion of dry raceme with one persistent fruit. Taken from Verdoorn (1961b).

Three varieties are recognised:

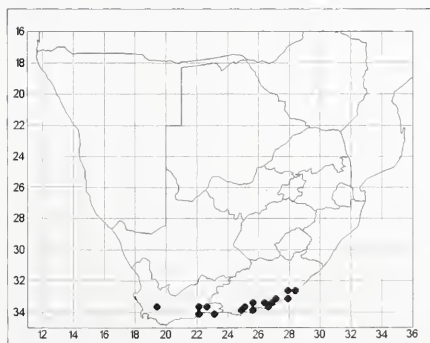
- 1a Sheathing leaf bases distinctly auriculate and ciliate; stems up to 5 m long; perianth longer than 27 mm; flowers subdensely arranged 82a. var. *ciliaris*
- 1b Sheathing leaf bases minutely auriculate and ciliate; stems up to 3 m long; perianth shorter than 27 mm; flowers laxly arranged:
- 2a Bracts 4–5 mm long; flowers 21–25 mm long 82b. var. *redacta*
- 2b Bracts 2–3 mm long; flowers 16–23 mm long 82c. var. *tidmarshii*

82a. var. *ciliaris*.

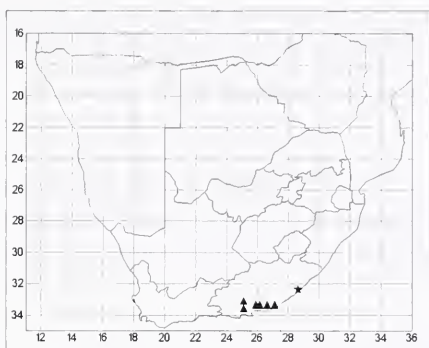
Description as for species. *Flowering time* throughout the year.

Endemic to the Western and Eastern Cape, except for a population in Kenya remarked upon by Reynolds (1950: 353). This is one of the few aloes in which flowering is equally probable at any time of the year. Map 58.

Aloe ciliaris differs from all other southern African species in having distinctly auriculate and ciliate leaf bases, and (in this variety) in being hexaploid ($2n = 42$; Brandham & Carter 1990). The typical variety differs from var. *tidmarshii* (no. 82c) in being larger in all its parts,



MAP 58.—*Aloe ciliaris* var. *ciliaris*



MAP 59.—★ *Aloe ciliaris* var. *redacta*
▲ *A. ciliaris* var. *tidmarshii*

and in having dense racemes of significantly longer flowers.

The specific epithet draws attention to the ciliate leaf bases. Haworth (1825) called this the 'fringing broader-leaved (aloe)', with a note that the breadth of the leaf was remarkable only in this section.

Vouchers: *Britten 2413* (PRE); *Fourcade 3680* (PRE, STE); *Long 1156* (PRE); *Reynolds 2393* (PRE); *Wells 2656* (GRA, PRE).

82b. var. *redacta* S.Carter in Brandham & Carter in Kew Bulletin 45: 643 (1990). Type: Eastern Cape, Qolora Mouth, *Wisura 2640* (K. holo.).

Leaves 70–110 × ± 13 mm; cilia 1–2 mm long. *Flowers* 21–25 mm long; pedicels 3–5 mm long. Tetraploid ($2n = 28$). Other characters as in var. *ciliaris*.

It appears to be restricted to a small area on the Kei River in the Eastern Cape. Map 59.

The rarest and most difficult to spot of the three varieties, the tetraploid ($2n = 28$; Brandham & Carter, 1990) is known from only a few gatherings. In all characters it is intermediate between the other two varieties.

The Latin word *redactus* means 'reduced', and applies best to the limited range of this variety.

Voucher: *Pegler 1426* (BOL, K).

82c. var. ***tidmarshii*** *Schönland* in Records of the Albany Museum 1: 41 (1903); A.Berger: 255 (1908); Brandham & Carter: 643 (1990). Type: Eastern Cape, Grahamstown, *Schönland 1487* (GRA, holo.; BOL!).

A. tidmarshii (*Schönland*) Muller in R.A.Dyer: t. 910 (1943); Reynolds: 354 (1950); Jeppe: 112 (1969); Bornman & D.S.Hardy: 193 (1972).

Stems scrambling, up to 3 m long, with leaves for much of their length. *Leaves* spreading, not auriculate, linear-lanceolate, 70–160 × 6–20 mm, thin to slightly fleshy, green. *Inflorescence* a simple, cylindric, subdense raceme, 200–300 mm long; bracts narrowly deltoid-acuminate, ± 4 × 2 mm, 1–5-nerved. *Flowers* coral-red to scarlet, cylindric, mouth region subventricose, 15–25 mm long; outer segments free for 4–8 mm, inner segments free; pedicels 4–6 mm long. *Anthers* not or hardly exserted. *Ovary* 4–6 × 1–2 mm, green; style exserted 1–3 mm. *Flowering time* November to April.

The geographical range of var. *tidmarshii* is much more restricted than that of var. *ciliaris* (no. 82a). It is endemic to the Eastern Cape and occurs on stony, clayey soils at higher altitude further from the sea than var. *ciliaris*, in relatively dense savanna woodland. Map 59.

The leaf bases of this variety are minutely ciliate and clasp the stem, unlike those of var. *ciliaris*, in which the leaf base forms a conspicuous fringed collar around the stem. The short flowers are borne in a lax raceme. The anthers and styles are included or hardly exserted, in contrast to the long-exserted anthers and styles of *A. tenuior* (no. 81). Plants of var. *tidmarshii* tend to become scramblers.

This variety is named after Mr E. Tidmarsh, who kept a hotel near Grahamstown at about turn of the 19th to the 20th century, and who

supplied Schönland with the plant from which the type specimen was prepared.

Vouchers: *Archibald 5859* (PRE); *Bayliss 7492* (MO); *Long 1156* (GRA, K); *Story 2374* (K, PRE); *Theron 1054* (PRE).

83. ***Aloe gracilis*** *Haw.* in The Philosophical Magazine 66: 279 (1825); *Haw.*: 90 (1830); Reynolds: 95 (1947b); Reynolds: 356 (1950); Jeppe: 113 (1969); Bornman & D.S.Hardy: 195 (1972); B.-E. van Wyk & G.F.Sm.: 98 (1996) non Baker, nec Schönland. Iconotype: Bauer plate at K, reproduced in Reynolds: 357 (1950).

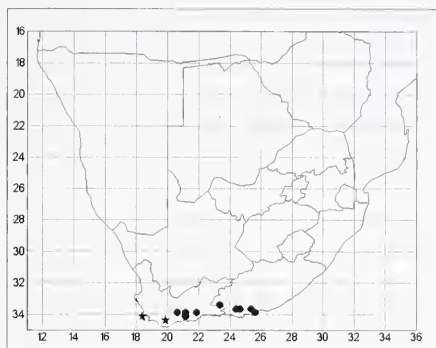
A. laxiflora N.E.Br.: 130 (1906); A.Berger: 255 (1908); Pole Evans: t. 303 (1928e). Type: Western Cape, no precise locality, *Griffiths s.n.* (K!).

A. gracilis *Haw.* var. *decumbens* Reynolds: 358 (1950); Jeppe: 113 (1969); Bornman & D.S.Hardy: 195 (1972). Type: Western Cape, Riversdale Division, *Muir 5383* (PRE!).

Plants shrubby, up to 2 m tall; stems erect, leaves present only in top 300–600 mm. *Leaves* spreading, not auriculate, 120–250 × 10–28 mm, slightly channelled, dull green. *Inflorescence* a simple, subdense, cylindric raceme, 200–400 mm long, sometimes branched; bracts narrowly deltoid-acuminate, 4–6 × 1.5–3.0 mm, 1–3-nerved. *Flowers* scarlet, 26–45 mm long, cylindric; outer segments free for 6–12 mm, inner segments free; pedicels 6–9 mm long, not or hardly longer in fruit. *Anthers* exserted up to 2 mm. *Ovary* 4.0–5.0 × 1.5–2.5 mm; style exserted up to 5 mm. *Fruit* ± 22 × 9 mm, almost black. *Flowering time* May to August.

Aloe gracilis is endemic to the southern parts of the Western and Eastern Cape and occurs in the ecotone between forest and fynbos at the eastern end of the area of rain in all seasons, in stony places on the coastal plain or up to the top of the first range of mountains. Map 60.

In vegetative characters this species resembles *A. striatula* (no. 85), but the leaves of this species are duller green and the leaf sheaths are not as distinctly striate as in that one. The flowers are borne in a lax raceme on slightly longer



MAP 60. —● *Aloe gracilis*
★ *A. commixta*

pedicels. They are similar to those of *A. ciliaris* (no. 82) but the leaf bases are very different and the racemes are much laxer than in that species.

Haworth (1825) considered his 'soft distant sword-leaved' aloe to be closely related to, but more slender (Latin *gracilis* = slender) than *A. caesia*, which Reynolds (1950: 413) showed to be a hybrid between *A. arborescens* and *A. ferox*.

Vouchers: *Brandham & Cutler 1538* (K); *Dahlstrand 3190* (MO, PRE); *Goldblatt 5427* (MO); *Marloth 13445* (PRE); *Paterson 53* (PRE).

84. *Aloe commixta* A. Berger in *Das Pflanzenreich* 33: 260 (1908); Reynolds: 359 (1950); Adamson: 171 (1950); Jeppe: 115 (1969); Bornman & D.S. Hardy: 197 (1972); B.-E. van Wyk & G.F.Sm.: 96 (1996). Type: Western Cape, Simonstown, *Wright s.n.* (K!).

A. gracilis Baker: 170 (1880a); Baker: 318 (1896a) non Haw. Type: not cited.

Plants shrubby, ± 1.5 m tall; stems with leaves for most of their length. *Leaves* erect to spreading, not auriculate, 110–200 \times 17–42 mm, slightly channelled, dull green. *Inflorescence* a simple, capitate, very dense raceme, 300–450 mm tall; bracts deltoid-acuminate, $\pm 4\text{--}6 \times 2.5$ mm, 1-nerved. *Flower* yellowish to orange, 28–40 mm long, cylindric; outer seg-

ments free to between middle and base, inner segments free; pedicels 6–8 mm long, lengthening to ± 12 mm in fruit. *Anthers* exerted up to 4 mm. *Ovary* $\pm 9 \times 4$ mm, green; style exerted up to 5 mm. *Fruit* not seen in ripe state. *Flowering time* August to September.

Aloe commixta is one of two species restricted to Table Mountain sandstone in the Western Cape. It receives very high winter rainfall, and is close to the base of the mist belt in summer. Map 60.

The short, subcapitate racemes of flowers which change colour as they age, distinguish this species from others of this section. This is the only species in the section that occurs on the Cape Peninsula. The habit and leaves of this species recall *A. striatula* (no. 85), but the leaves are more erect and the leaf sheaths less prominently striate.

The specific epithet is derived from the Latin word *commiscere*, 'to mix' or 'join together'. Berger notes in the first description that this species was confused by Baker and Schönland with *A. gracilis*, and that it is a vicariant of *A. striatula*. Either note would explain the name.

Vouchers: *Fair BOL7941* (BOL); *Marloth 8977* (PRE, STE); *Pillans s.n.* (BOL, GRA, PRE); *Thode 7923* (STE).

85. *Aloe striatula* Haw. in *The Philosophical Magazine* 66: 281 (1825); Baker: 318 (1896a); A. Berger: 259 (1908); Reynolds: 362 (1950); Jeppe: 114 (1969); Bornman & D.S. Hardy: 199 (1972); B.-E. van Wyk & G.F.Sm.: 100 (1996). Iconotype: Bauer plate at K, reproduced in Reynolds: 362 (1950).

A. macowanii Baker: 170 (1880a); Baker: 318 (1896a); Schönland: 42 (1903). Type: Eastern Cape, Boschberg, *MacOwan 1915* (K, holo.!; PRE, photo.!).

A. aurantiaca Baker: 780 (1892b); Baker: 318 (1896a). Type: Hort. La Mortola, *Hanbury s.n.* (K!).

A. cascadiensis Kuntze: 313 (1898). Type: Eastern Cape, East London, *Kuntze s.n.* (NY, holo.; BOL, photo.!).

Plants shrubby, 1.0–1.75 m tall; stems with leaves for most of their length. *Leaves* spreading to reflexed, not auriculate, 110–250 × 9–25 mm, channelled, glossy green; sheath striate. *Inflorescence* a simple, cylindric-conical, subdense raceme, 200–400 mm tall; bracts narrowly deltoid-acuminate, inconspicuous, 3–6 × 1–2 mm, 3–5-nerved. *Flowers* reddish to orange, decurved, 35–45 mm long; outer segments free almost to base, inner segments free but lightly adnate to outer; pedicels 3–6 mm long, lengthening to 8–10 mm in fruit. *Anthers* exerted 2–5 mm. *Ovary* 5.0–6.0 × 2.0–4.5 mm, pale lemon-yellow; style exerted 2–7 mm. *Fruit* ± 18 × 14 mm.

Aloe striatula occurs among rocks on mountain tops in the Eastern Cape. Its range is within the winter snow belt in one of the coldest parts of southern Africa.

The prominent green striations on the leaf sheaths in this species remain as brown longitudinal stripes in dried specimens; they can be used to distinguish this species from all others in this section. The dense, cylindric racemes of flowers with long recurved flowers and long-exserted anthers and styles are also diagnostic for this species.

Two varieties are recognised:

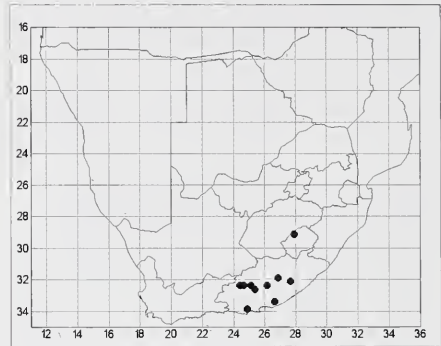
- Flower longer than 35 mm, reddish to orange 85a. var. *striatula*
 Flower shorter than 30 mm, yellow
 85b. var. *caesia*

85a. var. *striatula*.

Description as for species. *Flowering time* October to November.

Found in the Eastern Cape. Map 61.

Haworth (1825) called it the 'stripe-sheathed narrow-leaved' aloe, and the specific epithet draws attention to the striped leaf sheath. The Xhosa name for this species is *ingcelwane*. Notes on the specimen A. *Hutchings* 846 (KEI) indicate that this plant is used as a hedge for

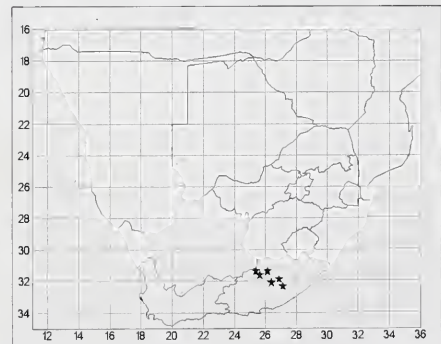


MAP 61.—*Aloe striatula* var. *striatula*

kraals. In addition, the roots are crushed in warm water as a treatment for constipation. The liquid is taken orally or as an enema.

Vouchers: *Acocks* 11962 (BM, PRE); *Burchell* 3115 (K); *Jacot Guillarmod* 4740 (PRE); *Liebenberg* 7678 (PRE); *Story* 4537 (BM, BOL, GRA, PRE).

85b. var. *caesia* *Reynolds* in *The Flowering Plants of South Africa* 16: t. 633 (1936j); *Reynolds*: 364 (1950); *Jepp*: 114 (1969); *Bornman & D.S.Hardy*: 199 (1972). Type: Eastern Cape, near Hofmeyr, *Reynolds* 1607 (PRE, holo.; BOL!).



MAP 62.—*Aloe striatula* var. *caesia*

Leaves 130–220 × 9–18 mm, glaucous green, denser than in var. *striatula*. *Flowers* yellow throughout, straight, 20–30 mm long. *Flowering time* (November to) December to January. Other characters as in var. *striatula*.

Endemic to the Eastern Cape. Map 62.

The varietal epithet *caesia* means 'blue-grey' and refers to the leaves, which are more glaucous than in the typical variety.

Vouchers: *Galpin 2620* (BOL, GRA, K, PRE); *Hilliard & Burt 14779* (NU); *Reynolds 2199* (PRE, SAM); *Theron 561* (PRE).

16. Section Aloe

Section **Aloe**. Type species: *A. perfoliata* L.

Section *Mitriformes* Salm-Dyck: 24 (1854). Type species: *A. perfoliata* L. (= *A. mitriformis* Mill.).

Series *Mitriformes* (Salm-Dyck) A.Berger: 273 (1908); Reynolds: 371 (1950). Type species: *A. mitriformis* Mill.

Plants pendent or decumbent to erect, 1–many-stemmed. *Leaves* spirally arranged, crowded or separated by distinct internodes, ovate-acute to ensiform or deltoid, margins and sometimes keel with ± stout teeth. *Inflorescence* simple or branched, usually with scattered sterile bracts; racemes usually capitate; flowers spreading to pendulous. *Flowers* cylindric; segments variously free or connate. *Anthers* not or hardly exserted. *Style* not or hardly exserted.

1a Leaves reflexed:

2a Plant erect; anthers and style distinctly exserted 86. *A. pearsonii*

2b Plant pendent; anthers and style not or hardly exserted 90. *A. dabenorisana*

1b Leaves erect to spreading:

3a Flower shorter than 25 mm; plants pendent from rock cracks 89. *A. meyeri*

3b Flower longer than 25 mm; plants erect or decumbent on sand:

4a Leaves copiously spotted; leaf teeth shorter than 2 mm 88. *A. arenicola*

4b Leaves not spotted or with few spots; leaf teeth longer than 2 mm 87. *A. perfoliata*

In this section the flowers are borne on very thin and wiry pedicels ± as long as the flowers. The racemes are subdensely subcapitate, and the inflorescences are generally simple or with few branches. The stems are elongated, but the leaves are much broader and stouter than those of section 15, *Macrifoliae*. In section *Aloe*, the stems are often decumbent, a character that is very unusual in *Macrifoliae*.

86. **Aloe pearsonii** *Schönland* in Records of the Albany Museum 2: 229 (1911); H.Pearson: 190 (1911); Reynolds: 366 (1950); Jeppe: 23 (1969); Sölch, Roessler & Merxm.: 18 (1970); D.S.Hardy: t. 1594 (1970); Bornman & D.S.Hardy: 201 (1972); Jankowitz: 44 (1975); B.-E. van Wyk & G.F.Sm.: 118 (1996). Type: Northern Cape, Richtersveld, *Pearson 6091* (GRA, holo.!, BM!, BOL!, SAM!, PRE, photo.).

Plants erect, shrubby, 1–2 m tall. *Leaves* appearing 4- or 5-ranked, reflexed, 50–90 ×

15–30 mm, biconvex to slightly channelled, maroon-red to greenish, with faint reddish striae, keel not dentate. *Inflorescence* lateral, simple to 3-branched, with scattered sterile bracts; racemes conical, subdense to capitate, very dense; bracts ± 6–7 × 4 mm, 1–3-nerved. *Flowers* golden yellow, or red with golden expanded mouth, straight, narrow, 20–25 mm long; outer segments free to middle, inner segments free but dorsally adnate to outer for ± half their length; pedicels ± 21 mm long. *Anthers* exserted 2–4 mm. *Ovary* 6–7 × 2–3 mm; style exsert-

ed 5–6 mm. Fruit $\pm 22 \times 7$ –8 mm. Flowering time January to February.

Aloe pearsonii occurs in pockets of sandy soil among rocks in one of the hottest and driest parts of the Namaqualand fog belt in Namibia and the Northern Cape. Precipitation is mostly from nocturnal mist, and rain is very scanty, mostly in winter. Map 63.

The habit of *A. pearsonii* recalls that of species of section 15, *Macrifoliae*, but the leaves of this species are much thicker, shorter and more leathery than any in that section. The flowers of *A. pearsonii* are narrow and cylindrical, borne on long pedicels, unlike any in section *Macrifoliae*. These characters, and microscopical details of the leaf surface anatomy, indicate that this species is much better placed here. The leaves of *A. pearsonii* are smaller than those of any species in section *Aloe* except *A. arenicola* (no. 88). In that species the stems are decumbent, and the leaves are incurved, with white spots and cartilaginous margins. In *A. pearsonii* the stems are rigidly erect, the leaves are reflexed and unspotted and the margins are not cartilaginous. *A. dabenorisana* (no. 90) is similar to *A. pearsonii* in having reflexed leaves, but in that species the leaves are larger, the plant is pendent not erect, and the anthers and style are not or hardly exerted. This is one of the slowest-growing of all aloes, and some of

the large shrubs in the Richtersveld are probably several hundred years old.

Prof. H.H.W. Pearson (1870–1916), after whom this species is named, was the first Harry Bolus Professor of Botany at the South African College (now University of Cape Town), and founded the National Botanical Gardens at Kirstenbosch. He collected the type specimen of this species on the first Percy Sladen Memorial Expedition to the Richtersveld in 1910–1911.

Vouchers: *Dinter 8185* (BM, BOL, K, PRE); *Glen 1501* (PRE); *Leistner 3411* (PRE); *Rodin 1601* (PRE).

87. *Aloe perfoliata* L., Species plantarum: 320 (1753); Webb: 20 (1980) non Thunb. Iconotype: *Aloe africana mitraeformis spinosa* Dillenius, Hortus elthamensis 21, t. 17, fig. 19 (1732).

A. perfoliata L. var. ν L.: 320 (1753). Iconotype: *Aloe africana mitraeformis spinosa* Dillenius, Hortus elthamensis 21, t. 17, fig. 19 (1732).

A. mitriformis Mill.: no. 1 (1768); Lam.: 87 (1783); DC.: t. 99 (1802); Ker Gawl.: t. 1270 (1810b); W.T.Aiton: 293 (1811); Haw.: 77 (1812); Haw.: 43 (1821); Salm-Dyck: 24, t. 4 (1854); Baker: 319 (1896a); A.Berger: 276 (1908); Reynolds: 371 (1950); Jeppe: 20 (1969); Bornman & D.S.Hardy: 203 (1972); Marais (1980); B.-E. van Wyk & G.F.Sm.: 116 (1996). *A. perfoliata* L. var. *mitriformis* (Mill.) Aiton: 467 (1789). Iconotype: *Aloe africana mitraeformis spinosa* Dillenius, Hortus elthamensis 21, t. 17, fig. 19 (1732).

A. mitriformis Mill. var. *angustior* Lam.: 87 (1783). Type: not cited.

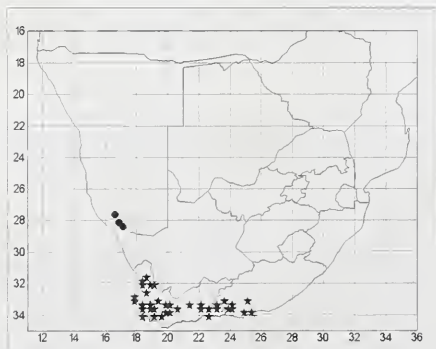
A. perfoliata L. var. *brevifolia* Aiton: 467 (1789). *A. mitriformis* Mill. var. *brevifolia* (Aiton) W.T.Aiton: 294 (1811); Ker Gawl.: t. 1362 (1811b). Type: not cited.

A. perfoliata L. var. κ Willd.: 186 (1799). Type: not cited.

A. albispina Haw.: 22 (1804); Haw.: 78 (1812); Baker: 320 (1896a). *A. mitriformis* Mill. var. *albispina* (Haw.) A.Berger: 278 (1908). Type: not cited.

A. brevifolia (Aiton) Haw.: 23 (1804) non Mill. Type: not cited.

A. flavispina Haw.: 22 (1804); Haw.: 77 (1812); Salm-Dyck: 24, t. 2 (1863). *A. mitriformis* Mill. var. *flavispina*



MAP 63.—● *Aloe pearsonii*
★ *A. perfoliata*

(Haw.) Baker: 171 (1880a); Baker: 319 (1896a); A.Berger: 278 (1908). Type: not cited.

A. nitrifolius Mill. var. *elator* Haw.: 23 (1804). Type: not cited.

A. nitrifolius Mill. var. *humilior* Haw.: 23 (1804); Willd.: 282 (1811). Type: not cited.

A. commelinii Willd.: 282 (1811); Haw.: 47 (1819); Haw.: 43 (1821); Salm-Dyck: 24, t. 5 (1863). *A. nitrifolius* Mill. var. *comelinii* (Willd.) Baker: 171 (1880a); Baker: 319 (1896a); A.Berger: 277 (1908). Type: not cited.

A. xanthacantha Willd.: 282 (1811); Salm-Dyck: 24, t. 3 (1854). *A. nitrifolius* Mill. var. *xanthacantha* (Willd.) Baker: 172 (1880a); Baker: 319 (1896a); A.Berger: 277 (1908). Type: not cited.

A. distans Haw.: 78 (1812); Haw.: 43 (1821); Salm-Dyck: 24, t. 1 (1854); Baker: 319 (1896a); A.Berger: 274 (1908); Reynolds: 377 (1950); Jeppe: 21 (1969); Bornman & D.S.Hardy: 205 (1972); B.-E. van Wyk & G.F.Sm.: 112 (1996)—synon. nov. Type: not cited.

A. parvispina Schönland: 283 (1905a); A.Berger: 280 (1908). Type: Western Cape, Heerenlogementsberg, Zeyher 4176 (SAM!).

A. comptonii Reynolds: 382 (1950); Jeppe: 19 (1969); Bornman & D.S.Hardy: 209 (1972); B.-E. van Wyk & G.F.Sm.: 108 (1996). Type: Western Cape, Uniondale, Reynolds 5725 (PRE!).

Plants erect to decumbent, rarely pendent, 0.3–1.0 m tall, decumbent and pendent forms with stems up to 2 m long, rarely longer. *Leaves* 20 or more per stem, in a rosette or spirally arranged, erectly spreading to arcuate-incurved, 120–300 × 50–150 mm, glaucous green to dull green, keels usually dentate. *Inflorescence* 2–5-branched, 400–600 mm tall, with sterile bracts above first branch; racemes very dense, capitate to shortly conical; bracts 7–10 × 3–6 mm, 3–5-nerved. *Flowers* coral-red to scarlet, 25–45 mm long; all segments free; pedicels 25–45 mm long. *Antlers* very shortly exerted. *Ovary* 7–8 × 2–3 mm, green; style very shortly exerted. *Fruit* 24–28 × 8–12 mm, grey-brown. *Flowering time* August to February, depending on locality.

Aloe perfoliata occurs in the Western and Eastern Cape, on sand and clay, and even in cracks in rock on cliffs, where it may become pendent. The surrounding vegetation is usually

a form of dry fynbos, though at the eastern end of its range this species may grow in karoo or grassland. Map 63.

Some forms of this variable species approach *A. arenicola* (no. 88) very closely. The leaves of that species are copiously spotted and have whitish horny margins, while in *A. perfoliata* the leaves are not or sparsely spotted, and the margins are not horny. Large-leaved forms of this species bear a superficial resemblance to *A. meyeri* (no. 89), which usually has a simple, much shorter inflorescence in which the flowers are shorter and narrower.

Linnaeus (1737, 1748) and Van Royen (1740) used a phrase-name for this plant indicating that the leaf bases clasp the stem. This evidently suggested the specific epithet (trivial name), which indicates that the stem passes through the leaves, to Linnaeus.

Vouchers: *Boucher 3550* (PRE, STE); *Hardy 249* (PRE); *Leach & Carp 11359* (PRE); *Marsh 1373* (PRE, STE); *Reynolds 4839* (BM, PRE, SAM).

Hybrid:

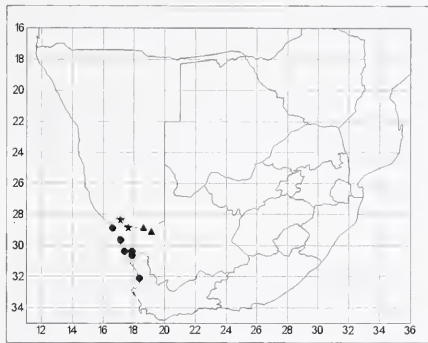
A. perfoliata × *A. maculata* (no. 45). See *A. maculata*.

88. ***Aloe arenicola*** Reynolds in *Journal of South African Botany* 4: 21 (1938c); Reynolds: 379 (1950); I.Verd.: t. 1467 (1966); Jeppe: 22 (1969); Bornman & D.S.Hardy: 207 (1972); B.-E. van Wyk & G.F.Sm.: 106 (1996). Type: Northern Cape, near Kleinsee, Reynolds 2574 (PRE, holo.!; BOL!).

Plants decumbent, 150–400 mm tall, leaves present in apical 200–300 mm of stems. *Leaves* ± 20 per stem, broadly deltoid, 120–200 × 35–60 mm, bluish green with scattered white spots, keels rarely dentate. *Inflorescence* a simple to twice-branched, very dense, capitate raceme, up to 500 mm tall; peduncle with few sterile bracts; bracts ovate, 9–11 × 3–5 mm, 5-



FIGURE 16.—Section *Aloe*. *Aloe meyeri*: habit, $\times 0.8$. Taken from Glen & Hardy (1993).



MAP 64. ● *Aloe arenicola*
 ★ *A. meyeri*
 ▲ *A. dabenorisana*

nerved. *Flowers* orange-red, 30–40 mm long; outer segments free for \pm half their length, inner segments free but adhering to outer for \pm half their length; pedicels 35–50 mm long. *Anthers* exerted up to 3 mm. *Ovary* 7–8 \times 2–3 mm; style exerted up to 6 mm. *Fruit* not seen. *Flowering time* October to January.

Aloe arenicola occurs in the Northern and Western Cape, and grows only on sand within a few hundred metres of the beach, in the winter-rainfall area in coastal fynbos and succulent karoo. Map 64.

Differences between this species and *A. perfoliata* (no. 87) are dealt with under that species. The leaves of *A. arenicola* are similar in size to those of *A. meyeri* (no. 89), but the two species differ in numerous characters and are difficult to confuse. *A. arenicola* is decumbent on sand near the coast, with leaves which clothe the elongated stem, whereas *A. meyeri* is pendent on rocks further inland, and bears its leaves in a distinct rosette. The inflorescences of *A. arenicola* are longer than those of *A. meyeri*, and bear larger flowers on longer pedicels.

The specific epithet describes the habitat of this species; it is derived from two Latin words (*h)arena* (= sand) and *colere* (= to dwell, frequent or inhabit), hence, the sand-dwelling aloe.

Vouchers: *Compton* 21885 (NBG); *Hardy* 1934 (PRE); *Leach & Carp* 11378 (K, PRE, SRGH); *Le Roux* 2640 (BOL); *Pillans* 8368 (BOL).

Hybrid:

A. arenicola \times *A. krapohliliana* (no. 30). See *A. krapohliliana*.

89. *Aloe meyeri* Van Jaarsv. in *Journal of South African Botany* 47: 567 (1981); Vorster: 175 (1983); Glen & D.S.Hardy: t. 2065 (1993); B.-E. van Wyk & G.F.Sm.: 114 (1996). Type: Northern Cape, Richtersveld, *Van Jaarsveld* 6137 (NBG!).

A. richtersveldensis Venter & Beukes: 675 (1982). Type: Northern Cape, Richtersveld, *Venter* 8264 (BLFU, holo.; K, PRE!).

Plants pendent; stems simple or branched. *Leaves* in an elongated rosette \pm 300 mm long; spreading to erect, not recurved, lanceolate, 130–200 \times 30–40 mm, dull green, sometimes tinged reddish brown. *Inflorescence* a simple, rarely branched, dense, capitate raceme, 150–250 mm long; peduncle reflexed, with sterile bracts; bracts \pm 5 \times 2–3 mm, 3-nerved. *Flowers* orange-red, tipped green, 20–23 mm long; all segments free; pedicels 17–20 mm long. *Anthers* exerted up to 3 mm. *Ovary* \pm 4–5 \times 2 mm, green; style exerted up to 3 mm. *Fruit* not seen. *Flowering time* December to February. Figure 16.

Aloe meyeri is endemic to the Northern Cape and grows in rock cracks on cliffs in one of the most arid parts of the winter-rainfall area. In the range of this species, most of the precipitation received is in the form of condensation from fog. Map 64.

Differences between this species on the one hand and *A. perfoliata* (no. 87) and *A. arenicola* (no. 88) on the other are dealt with under those species. The leaves of *A. meyeri* are erect to spreading, unlike those of *A. dabenorisana* (no. 90), which are reflexed, and are smaller than those of that species. The inflorescence is

smaller and the bracts are 3-nerved, not 1-nerved.

This species is named after Rev. L.G. Meyer (1867–1958), who discovered it while on an expedition to the Richtersveld with A.G.J. Herre in 1939. Rev. Meyer was a missionary in Namaqualand, where he collected many plants and insects. L. Bolus named a number of his new discoveries in the Mesembryanthemaceae after him (Gunn & Codd 1981).

Vouchers: *Ihlenfeldt* PRE639897 (PRE); *Van Jaarsveld* 5530 (NBG).

90. ***Aloe dabenorisana*** *Van Jaarsv.* in *Journal of South African Botany* 48: 419 (1982); B.-E. van Wyk & G.F.Sm.: 110 (1996). Type: Northern Cape, Dabenoris Mts, *Van Jaarsveld & Kritzing* 6426 (NBG, holo.!, PRE, photo.!).

Plants pendent, usually in clumps up to 800 mm in diameter. *Leaves* 4- or 5-ranked in young plants, later rosulate, rosettes up to $\pm 450 \times 450$ mm, strongly recurved, narrowly lanceolate-acuminate, $200\text{--}400 \times 40\text{--}55$ mm, slightly channelled, green to reddish, striate when green. *Inflorescence* usually a 2–4-branched, dense, capitate to conical raceme, 250–300 mm

long; peduncle reflexed, with few sterile bracts; bracts $6\text{--}10 \times 2\text{--}3$ mm, 1-nerved. *Flowers* red to yellow, 23–25 mm long; all segments free; pedicels 20–30 mm long. *Anthers* not or slightly exserted. *Ovary* $5\text{--}7 \times 2\text{--}3$ mm, green; style not or slightly exserted. *Fruit* not seen. *Flowering time* sporadically throughout the year, but mostly August to November.

Aloe dabenorisana is endemic to the Northern Cape and grows on almost inaccessible cliffs on the highest of the Orange River hills, in an area of arid Namaqualand Broken Veld. Rain is equally unlikely in all seasons, and mist precipitation is probably important in the water relations of this species. Map 64.

With its pendent habit, recurved leaves and 1-nerved bracts, this species is difficult to confuse with any other. Differences between it on the one hand and *A. pearsonii* (no. 86) and *A. meyeri* (no. 89) on the other are discussed under those species.

This species is named after the type locality, an almost inaccessible hill near the lower Orange River.

Voucher: *Van Jaarsveld & Patterson* 6638 (NBG).

17. Section **Purpurascentes**

Section **Purpurascentes** *Salm-Dyck*, *Monographia generum Aloes et Mesembryanthemi*: 22 (1842). Type species: *A. succotrina* All.

Series *Purpurascentes* (Salm-Dyck) A.Berger: 282 (1908); Reynolds: 389 (1950).

Plants solitary or in dense groups, stemless or caulescent. *Leaves* densely rosulate, ensiform, with or without white spots, margins dentate with stout teeth. *Inflorescence* a simple to 8-branched cylindric to conical raceme with sterile bracts. *Flowers* spreading to pendulous, cylindric to cylindric-trigonus, sometimes subventricose or widening gradually towards mouth; segments free. *Anthers* variously exserted. *Style* variously exserted.

1a Plants solitary:

2a Bracts shorter than pedicels; flower cylindric, subclavate

. 92a. *A. microstigma* subsp. *microstigma*

2b Bracts longer than pedicels; flower cylindric-trigonus, ventricose 93. *A. gariensis*

1b Plants in clumps:

- 3a Inflorescence simple; leaves usually unspotted; sap purple 91. *A. succotrina*
 3b Inflorescence branched; leaves usually copiously spotted; sap yellow
 92b. *A. microstigma* subsp. *framesii*

Species of this section are typically plants of the winter-rainfall area of the Western and Northern Cape, unlike those of section 18, *Arborescentes*, which with few exceptions grow in the summer-rainfall area. The leaves of plants in this section are often randomly spotted or lined. When fresh, they are green tinged with purple, or even rust-brown with no trace of green in *A. gariepensis*, but only in *A. succotrina* do they dry deep purple.

91. **Aloe succotrina** All., Auctarium ad synopsis methodicam stirpium horti regii Taurinensis: 13 (1773); Lam.: 85 (1783); Salm-Dyck: 22, t. 1 (1842); Baker: 321 (1896a); A. Berger: 282 (1908); Reynolds: 1 (1948b); Reynolds: 389 (1950); Adamson: 171 (1950); Jeppe: 50 (1969); Bormman & D.S. Hardy: 213 (1972); B.-E. van Wyk & G.F. Sm.: 88 (1996). Iconotype: *A. succotrina, angustifolia spinosa, flore purpureo* J. Commelijn, Horti medici Amstelædamensis 1: 91, t. 48 (1697).

A. perfoliata L. var. ξ L.: 320 (1753). Type: not cited.

A. vera Mill.: no. 15 (1768) non (L.) Burm.f. Type: not cited.

A. perfoliata L. var. *purpurascens* Aiton: 466 (1789). *A. purpurascens* (Aiton) Haw.: 20 (1804); W.T. Aiton: 292 (1811); Haw.: 75 (1812); Salm-Dyck: 22, t. 2 (1842); Baker: 322 (1896a); A. Berger: 284 (1908). *A. socotrina* DC. b *purpurascens* (Aiton) Ker Gawl.: t. 1474 (1812b). Type: not cited.

A. perfoliata L. var. *succotrina* (Lam.) Aiton: 466 (1789); Curtis: t. 472 (1800). Type: not cited.

A. sinuata Thunb.: 61 (1794); Thunb.: 311 (1823). Type: not cited.

A. socotrina DC.: t. 85 (1802). Type: not cited.

A. soccotorina Schult. & Schult.f.: 701 (1829). Type: not cited.

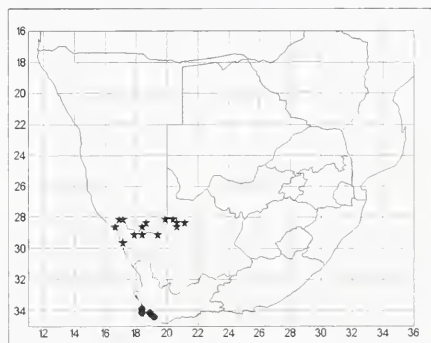
A. succotrina All. var. *saxigena* A. Berger: 283 (1908). Type: Western Cape, Steenbras River Mouth, Marloth 4357 (B).

Plants in dense groups, almost stemless to shrubby, 1–2 m tall. *Leaves* many, arcuate-erect, 250–500 \times 35–100 mm, grey to grey-green, obscurely lined, sometimes with few white spots. *Inflorescence* usually a simple, dense, conical

raceme 0.75–1.0 m tall; peduncle with many sterile bracts; bracts lanceolate-acute to obovate-acute, 15–21 \times 5–10 mm, 5–many-nerved. *Flowers* glossy red to salmon, 25–40 mm long; pedicels 20–30 mm long. *Antlers* exerted 3–5 mm. *Ovary* 7–9 \times 2–3 mm, green; style exerted 5–8 mm. *Fruit* not seen. *Flowering time* July to August.

Aloe succotrina occurs in mountain fynbos on Table Mountain sandstone in the southwestern corner of the Western Cape in areas of high winter rainfall, generally close to the sea. Map 65.

This species is easily confused with *A. arborescens* (no. 96). It may be distinguished by the leaf sap, which dries such an intense shade of purple that the whole dried leaf is stained almost black (not golden yellow), and by the narrower almost cylindric racemes of slightly shorter flowers on shorter pedicels. *A. microstigma* (no.



MAP 65.—● *Aloe succotrina*
 ★ *A. gariepensis*

92) has more broadly conical racemes, which are often bicoloured as the flowers in most populations of that species change colour as they mature, and has leaves with many more spots and which do not dry purple.

Reynolds (1950: 394) offers two explanations of the specific name, and points out that both rest on misunderstandings of the plant in question. The simpler is that this species was thought to be the source of the drug Socotran aloes, and so the word *succotrina* should be translated as 'Socotran'. The other is that it is derived from the Latin phrase *succo citrino* meaning 'with yellow juice' (although one of the most distinctive features of this species is its purple juice).

Vouchers: *Boucher 582* (PRE, STE); *MacMurtry 202* (PRE); *Marloth 10033* (PRE); *Reynolds 5132* (PRE); *Van Balen 951* (PRE).

Hybrid:

A. succotrina × *A. arborescens* Mill. (no. 96).
Voucher: *Becker s.n.* (K) is possibly this hybrid.

92. *Aloe microstigma* Salm-Dyck, Monographia generum Aloes et Mesembryanthemi: 26, t. 4 (1854); Baker: 316 (1896a); A. Berger: 285 (1908); Reynolds: 396 (1950); Jeppe: 33 (1969); Sölch, Roessler & Merxm.: 18 (1970); Bornman & D.S. Hardy: 215 (1972); Jankowitz: 26 (1975); B.-E. van Wyk & G.F. Sm.: 176 (1996).
Iconotype: Salm-Dyck, Monographia generum Aloes et Mesembryanthemi: 26, t. 4 (1854).

A. juttae Dinter: 159 (1923b). Type: Namibia, between Gubub and Aus, *Dinter 3601* (B, holo.; BOL!, PRE!).

A. brunthaleri A. Berger ex Cammerloher: 131 (1933). Type: Western Cape, Matjiesfontein, *Brunthaler* (B†?).

A. khamiesensis Pillans: 25 (1934b); Reynolds: 404 (1950); Jeppe: 51 (1969); Bornman & D.S. Hardy: 221 (1972); B.-E. van Wyk & G.F. Sm.: 174 (1996). Type: Northern Cape, Khamieskroon. *Pillans 6665* (BOL, holo.; NBG!).

Plants solitary, stemless or caulescent, 0.5–2.0 m tall. *Leaves* many, lanceolate-deltoid, arcuate-erect, 200–500 × 15–80 mm, green with

reddish tinge, obscurely lined, with irregular H-shaped white spots. *Inflorescence* a simple, dense, conical raceme, 2–5 simultaneously; peduncle with many sterile bracts; bracts lanceolate-acute to ovate-acute, 15–19 × 4–8 mm, 7–many-nerved. *Flowers* dull red to yellow in bud, orange later, greenish yellow or yellow at flowering, subventricose with slight constriction at mouth, 18–30 mm long; pedicels 14–30 mm long. *Anthers* exerted 1–3 mm. *Ovary* 4.0–8.0 × 1.5–3.0 mm, green; style exerted up to 3 mm. *Fruit* 20.0–30.0 × 7.5–9.0 mm, grey-brown tinged with maroon.

Differences between this species on the one hand and *A. succotrina* (no. 91) and *A. gartepensis* (no. 93) on the other, are discussed under those species. This is a very variable species, and individual characters seem to vary independently.

The specific epithet is derived from two Greek words meaning 'small stigma'.

Two subspecies are recognised:

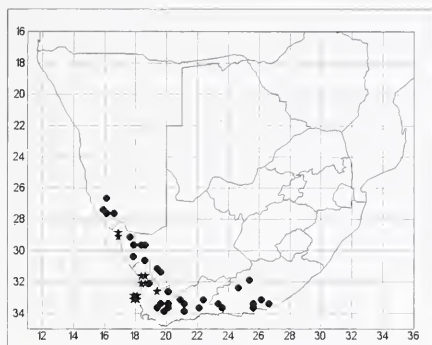
Plants solitary; stems, where visible, recumbent to erect; plants from inland localities 92a. subsp. *microstigma*
Plants in clumps; stems, where visible, decumbent, rarely oblique to erect; most plants from coastal plain 92b. subsp. *framesii*

92a. subsp. *microstigma*.

Description as for species. *Flowering time* May to August.

Aloe microstigma subsp. *microstigma* grows on rocky outcrops in karoo, desert, semidesert and Namaqualand broken veld, generally inland of the Western Cape escarpment (Western and Northern Cape Provinces) and as far north as Aus in Namibia. Map 66.

Plants of this subspecies may be almost stemless or have oblique to erect stems, but the



MAP 66.—● *Aloc microstigma* subsp. *microstigma*
★ *A. microstigma* subsp. *framesii*

stems are usually not recumbent. They occur as solitary individuals or rarely with stems branched once or twice. The inflorescences are usually simple and the racemes bicoloured.

Vouchers: *Giess 13368* (MO, PRE, WIND); *Hardy 5056* (PRE); *Lewis 3217* (SAM); *Muir 3619* (PRE); *Reynolds 5440* (PRE, SAM).

Hybrids:

1. *A. microstigma* subsp. *microstigma* × *A. humilis* (no. 29). See *A. humilis*.

2. *A. microstigma* subsp. *microstigma* × *A. africana* (no. 109). Voucher: *Reynolds 1422* (PRE).

92b. subsp. **framesii** (*L.Bolus*) *Glen & D.S.Hardy*, comb. et stat. nov.

Type: Northern Cape, near Port Nolloth, *Frames BOL19186* (BOL!).

A. framesii L.Bolus in *South African Gardening and Country Life* 23: 140 (1933); *Pole Evans*: t. 731 (1939c); *Reynolds*: 403 (1950); *Jepp*: 26 (1969); *Bornman & D.S.Hardy*: 219 (1972); *B.-E. van Wyk & G.F.Sm.*: 170 (1996).

A. amoena Pillans: 168 (1933c). Type: Western Cape, near Vanrhynsdorp, *Pillans BOL16024* (BOL!).

Plants in dense groups. *Leaves* lanceolate, arcuate-incurved to erectly spreading, grey-

green to bluish green, with 0–many irregular white spots. *Inflorescence* usually 2- or 3-branched below middle, up to 700 mm tall; peduncles with few ovate-acuminate sterile bracts. *Flowers* scarlet to orange, 25–35 mm long; style exserted 2–6 mm. *Flowering time* June to August.

Aloc microstigma subsp. *framesii* grows on sand on the coastal plain of the Northern and Western Cape, below the escarpment. One exceptional gathering of this subspecies is known from the top of the escarpment. Map 66.

Plants of this subspecies are almost stemless or with short, recumbent or rarely oblique stems. They rarely occur as solitary individuals, but usually in large clumps. The inflorescences are usually 2- or 3-branched, with unicoloured racemes.

This subspecies is named after Mr P. Ross Frames (1863–1947), an enthusiastic collector of succulent plants and sometime member of the Board of Trustees of the National Botanic Gardens (Kirstenbosch), who collected the type specimen.

Vouchers: *Hall 731* (NBG); *Marloth 10996* (PRE); *Marsh 186* (PRE); *Pole Evans s.n.* (K); *Reynolds 2558* (BOL, PRE).

93. ***Aloc gariensis*** Pillans in *South African Gardening and Country Life* 23: 213 (1933a); *Reynolds*: 400 (1950); *Jepp*: 32 (1969); *Sölch, Roessler & Merxm.*: 16 (1970); *Bornman & D.S.Hardy*: 217 (1972); *I. Verd.*: t. 1654 (1972); *Jankowitz*: 28 (1975); *B.-E. van Wyk & G.F.Sm.*: 172 (1996). Type: Namibia, near Warmbad, *Pillans 6557* (BOL!).

A. gariusana Dinter: 31 (1928) nom. nud.

Plants usually solitary, stemless to short-stemmed, up to 1 m tall. *Leaves* many, lanceolate to deltoid, arcuate-erect to arcuate-incurved, 250–500 × 50–90 mm, dull green to reddish brown, obscurely lined, with or without spots. *Inflorescence* a simple, very dense, cylin-

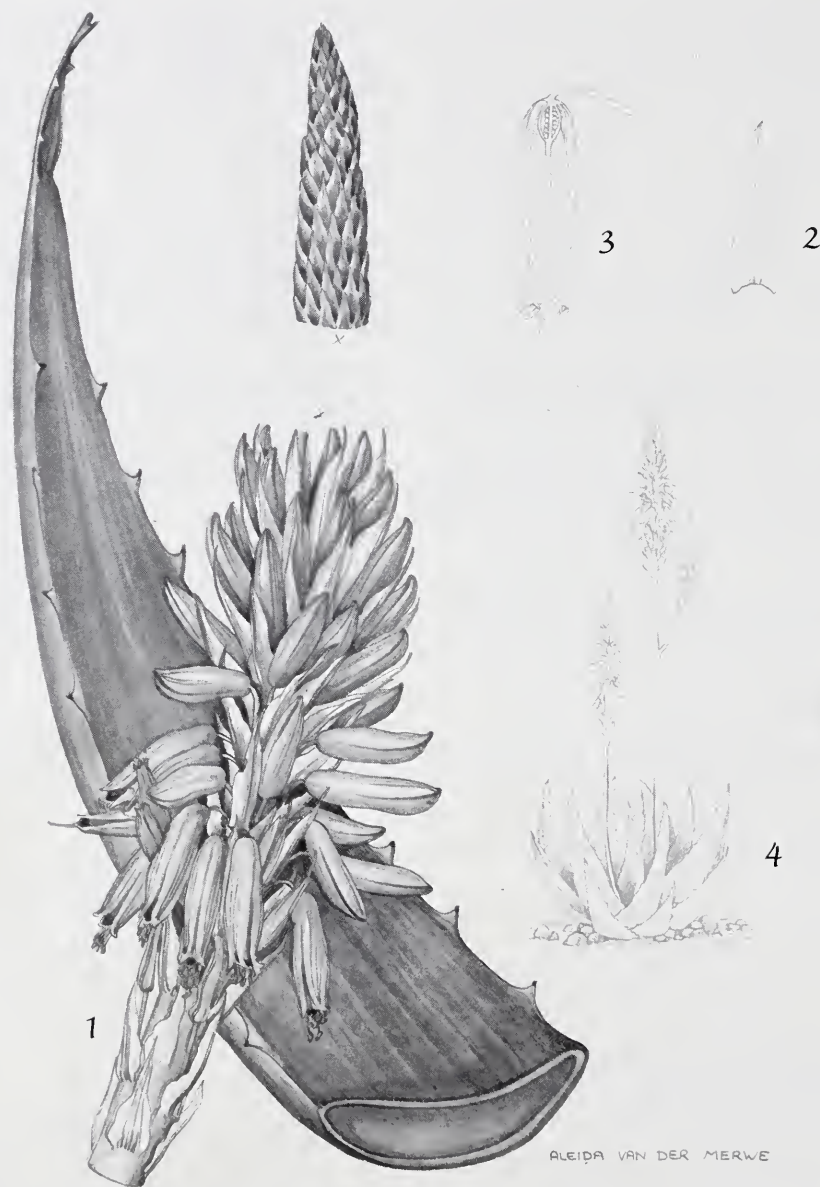


FIGURE 17.—Section *Purpurascens*. *Aloe gariepensis*: 1, portion of leaf, lower and apical section of raceme; 2, bract from base of raceme, $\times 1.3$; 3, longitudinal section of flower, $\times 1.5$; 4, habit. Taken from Verdoorn (1972).

dric to conical raceme, 3–5 simultaneously, 0.8–1.2 m tall; peduncle with many sterile bracts; bracts narrowly lanceolate-acuminate, 17–26 × 6–8 mm, 5–7-nerved. *Flowers* usually yellow, rarely brick-red, 16–27 mm long; pedicels 12–20 mm long, lengthening to ± 25 mm in fruit. *Anthers* exserted 1–5 mm. *Ovary* 4.0–5.0 × 1.5–2.0 mm, green; style exserted 3–6 mm. *Fruit* ± 14–16 × 8–9 mm, yellow-brown. *Seeds* ± 5 × 2 × 1 mm, black with pale transverse wings at each end. *Flowering time* July to September. Figure 17.

This species is found in Namibia and the Northern Cape. Typically it grows in rock cracks on steep slopes close to the Orange River in the driest part of its course. In some localities it occurs in small pockets of sandy soil on rocky outcrops. Map 65.

Aloe gariepensis is the only species in this section in which the flowers are usually yellow

both in bud and at flowering. Plants are usually solitary, unlike the much-branched, shrubby *A. succotrina* (no. 91), and the leaf sap does not dry purple, with the result that dried leaves are not this colour. The leaves of *A. gariepensis* are lined, and may be spotted or unspotted. The eastern form of this species is much more robust than the type.

This species is named after the type locality !garib, a Khoikhoi word meaning a large (or possibly permanent) river, and in particular the Orange River.

Vouchers: *Dinter* 5211 (BOL, PRE); *Giess* 14510 (PRE); *Hardy* 2314 (PRE); *Marloth* 13249 (PRE, STE); *Reynolds* 2555 (PRE).

Hybrid:

A. gariepensis × *A. krapohlana* (no. 30). See *A. krapohlana*.

18. Section **Arborescentes**

Section **Arborescentes** *Salm-Dyck*, Monographia generum Aloes et Mesembryanthemi: 26 (1849). Type species: *A. arborescens* Mill.

Series *Arborescentes* (Salm-Dyck) A.Berger: 287 (1908); Reynolds: 406 (1950).

Plants stemless to tree-like; stems with few to many branches. *Leaves* densely rosulate, ensiform, margins dentate with cartilaginous teeth. *Inflorescence* simple or branched, cylindric to conical racemes; peduncles with sterile bracts. *Flowers* pendulous at anthesis, straight, cylindric, segments free. *Anthers* hardly to distinctly exserted. *Style* hardly to distinctly exserted.

1a Inflorescence simple:

2a Plants erect; usually in dense clumps; stem branched at or near ground level; inflorescence ± 800 mm tall 96. *A. arborescens*

2b Plants pendent; solitary; inflorescence ± 250 mm tall 95. *A. hardyi*

1b Inflorescence branched:

3a Plants with a distinct trunk, 2 to 3 m tall; leaves up to 60 mm wide 97. *A. pluridens*

3b Plants almost stemless, up to 600 mm tall; leaves wider than 80 mm 94. *A. vanbalenii*

In tropical Africa the shrubby aloes are a very difficult group, with polyploidy and hybridisation frequently complicating an already involved picture. The southern African representatives of this section may be regarded as illustrating the extremes of variation in the group, with two species being arborescent, one being pendent and one forming dense, low clumps. Unlike section 17, *Purpurascens*, this section occurs in the summer-rainfall area or in the area of rain in all seasons,



FIGURE 18.—Section *Arborescentes*. *Aloe hardyi*: 1, upper part of leaf, $\times 0.9$; 2, inflorescence, $\times 0.9$; 3, habit, much reduced; 4, transverse section of leaf, $\times 0.9$. Taken from Glen (1987).

with only isolated populations of *A. arborescens* in the winter-rainfall area. Flowers in this section have broader flower tubes and more exerted anthers and stamens than those in section *Purpurascens*. The leaves of the arborescent aloes lack the spots, longitudinal lines and purplish tinge of those of section *Purpurascens*; in no species in this section do they dry purple.

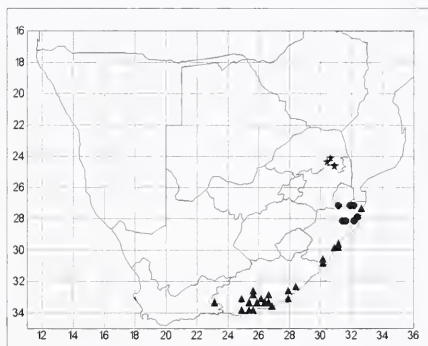
94. *Aloe vanbalenii* Pillans in South African Gardening and Country Life 24: 25 (1934b); Pole Evans: t. 608 (1936i); Reynolds: 420 (1950); Jeppe: 104 (1969); Bornman & D.S.Hardy: 229 (1972); Compton: 102 (1976); B.-E. van Wyk & G.F.Sm.: 90 (1996). Type: KwaZulu-Natal, near Mahlabathini, J.C. van Balen NBG2778/29 (BOL!).

Plants almost stemless, 300–600 mm tall, in dense groups. *Leaves* many per rosette, 500–800 × 90–150 mm, deeply channelled, green to copper-red. *Inflorescence* a 2- or 3-branched dense, cylindric-conical raceme ± 1 m tall; peduncle without sterile bracts below first branch; bracts ovate-obtuse, 15–17 × 6–7 mm, 7–many-nerved. *Flowers* orange-yellow, dull red or bicoloured, 30–40 mm long; pedicels 14–23 mm long, lengthening to 25–30 mm in fruit. *Antthers* exerted 1–10 mm. *Ovary* ± 5 × 2 mm; style exerted 9–12 mm. *Fruit* not seen. *Flowering time* June to July.

Aloe vanbalenii grows on flat rocks and rocky outcrops with minimal amounts of soil in Acocks's (1988) Nkonkoni Veld and Zululand Thornveld in Swaziland and KwaZulu-Natal. This area is frost-free and has moderately high summer rainfall. Map 67.

The almost stemless, suckering habit and broad, deeply channelled (U-shaped in section), recurved leaves of this species distinguish it from all others of this section. The leaves resemble those of *A. alooides* (no. 101), but that species is caulescent and has much smaller, sessile flowers.

The species is named after Mr J.C. van Balen (1894–1956), a noted horticulturist, who collected the type specimen. The Zulu common names *icenalamatshe* and *icenandhlovu* are recorded for this species (Reynolds 1950).



MAP 67.—● *Aloe vanbalenii*
★ *A. hardyi*
▲ *A. pluridens*

Vouchers: *Christian* 615 (SRGH); *Gerstner* 564 (BOL); *Reynolds* 5376 (BM, PRE); *Ward* 2628 (NH, NU, PRE).

95. *Aloe hardyi* Glen in The Flowering Plants of Africa 49: t. 1942 (1987); B.-E. van Wyk & G.F.Sm.: 82 (1996). Type: Mpumalanga, Lydenburg District, *Fourie* 3252 (PRE!).

Plants pendent; stems up to ± 1.5 m long, rosettes 300–600 × 300–600 mm. *Leaves* sometimes distichous, 12–20 per rosette, hanging, 400–700 × 50–80 mm, glaucous blue-green. *Inflorescence* a simple, subdense, conical to subcapitate raceme, 2 or 3 simultaneously, ± 250 mm long; peduncle with few truncate sterile bracts; bracts obovate-acute, 14–17 × 10–15 mm, many-nerved. *Flowers* pink to red, slightly trigonously indented, 25–35 mm long; pedicels 15–30 mm long. *Antthers* exerted up to 5 mm. *Style* exerted up to 8 mm. *Flowering time* June to August. Figure 18.

Aloe hardyi occurs in almost inaccessible places on cliffs on the escarpment in the Northern

Province. Its exact range is not known because of the difficulty of approaching plants. It grows in the mist belt in an area of high summer rainfall, warm summers and cold winters. The area in which it occurs is notable for the high proportion of endemism in the local flora. Map 67.

The two aloes most similar to this species are *A. arborescens* (no. 96) and the Angolan species *A. mendesii*. Differences between this species and *A. arborescens* are discussed under that species. *A. mendesii* is also a pendent species with hanging leaves and conical racemes, but it has much narrower bracts with only 5 nerves, shorter pedicels and flowers, and less exerted anthers and styles.

This species was named after the late Dave Hardy in recognition of his many years of study of all African succulents, but particularly of the genus *Aloe*. This study has culminated in his valued co-authorship of this treatment.

Voucher: *Glen 1807* (PRE).

96. *Aloe arborescens* Mill., The gardener's dictionary: no. 3 (1768); DC.: t. 38 (1800); Andrews: t. 468 (1807); Ker Gawl.: t. 1306 (1810c); W.T.Aiton: 292 (1811); Haw.: 76 (1812); Salm-Dyck: 26, t. 3 (1849); Baker: 322 (1896a); A.Berger: 288 (1908); Reynolds: 407 (1950); Adamson: 171 (1950); Jeppe: 48 (1969); Bornman & D.S.Hardy: 223 (1972); Palmer & Pitman: 375 (1972); West: 91 (1974); Compton: 97 (1976); B.-E. van Wyk & G.F.Sm.: 74 (1996). Neotype: Eastern Cape, Fort Cunyng-hame, *Galpin 2463* (PRE, holo.!; GRA!), here designated.

A. perfoliata L. var. η L.: 320 (1753). Iconotype: *A. africana caulescens, foliis glaucis caulem amplexantibus* C.Commelijn, *Horti medici Amstelædamensis*: 27, t. 14 (1706).

A. arborea Medik.: 305 (1783). Based on *A. arborescens* Mill.

A. fruticosa Lam.: 87 (1783); Pers.: 378 (1805). Type: not cited.

Catevala arborescens (Mill.) Medik.: 67 (1786). Type: not cited.

A. perfoliata L. α *arborescens* (Mill.) Aiton: 466 (1789). Type: not cited.

A. frutescens Salm-Dyck: 30 (1817); Haw.: 46 (1819). *A. arborescens* Mill. var. *frutescens* (Salm-Dyck) Link: 339 (1821); Baker: 322 (1896a); A.Berger: 293 (1908); Pole Evans: t. 187 (1925b). Type: not cited.

A. natalensis J.M.Wood & M.S.Evans: 9 (1900); J.M.Wood & M.S.Evans: 170 (1901); J.M.Wood & M.S.Evans: t. 258 (1902). *A. arborescens* Mill. var. *natalensis* (J.M.Wood & M.S.Evans) A.Berger: 290 (1908); C.H.Wright: t. 8663 (1916). Type: KwaZulu-Natal, Inanda, *Wood 4342* (NH, holo.!; K!: PRE, photo.!).

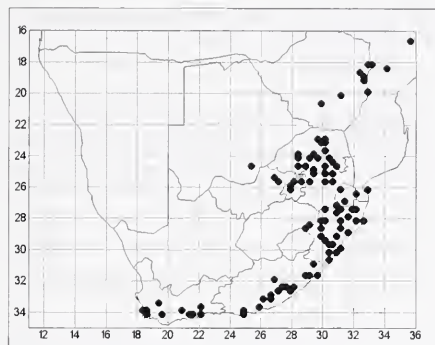
A. arborescens Mill. var. *milleri* A.Berger: 288 (1908). Type: Hort. Palermo, *Schweinfurth s.n.* (B?).

A. arborescens Mill. var. *pachythyrsa* A.Berger: 292 (1908). Iconotype: A.Berger in *Das Pflanzenreich* 33: 292 (1908).

A. mutabilis Pillans: 167 (1933c); Pole Evans: t. 611 (1936j); Reynolds: 418 (1950); Jeppe: 49 (1969); Bornman & D.S.Hardy: 227 (1972); B.-E. van Wyk & G.F.Sm.: 84 (1996). Type: Northern Province, near Warmbaths, *J.C. van Balen BOL20477* (= *NBG2720/29*) (BOL!).

Much-branched arborescent shrubs up to 3 m tall; if on rock faces then solitary to few-branched. *Leaves* many per rosette, spreading to slightly reflexed, 250–600 \times 20–70 mm, blue-green. *Inflorescence* usually a simple, rarely branched, dense, broadly conical, \pm 800 mm long raceme; bracts ovate-acute, 12–20 \times 7–12 mm, many-nerved. *Flowers* scarlet throughout, or becoming yellow at anthesis, 30–40 mm long; pedicels 20–40 mm long. *Anthers* exerted 1–5 mm. *Ovary* 4–10 \times 1.5–3.0 mm, green; style exerted 3–9 mm. *Fruit* \pm 22 \times 6–7 mm, pale grey. *Flowering season* (April to) June to July, depending on locality.

Aloe arborescens is found in Botswana, Swaziland, the Northern Province, North-West, Gauteng, Mpumalanga, KwaZulu-Natal, the Western and Eastern Cape; also in Malawi, Mozambique and Zimbabwe. It usually occurs in pockets of rich soil on rocky outcrops in mountains in areas of high summer rainfall. The Cape Peninsula populations are also found in rocky places, but here the highest rainfall is in winter. Plants growing on deep soil probably indicate abandoned sites of cultivation. Map 68.

MAP 68.—*Aloe arborescens*

This species is one of the most variable of the southern African representatives of the genus *Aloe*. It differs from *A. pluridens* (no. 97) in branching much more freely and in having broader, more glaucous green leaves. The racemes of *A. arborescens* are denser, broader and more obtuse than those of *A. pluridens*. *A. hardyi* (no. 95) is always pendent, whereas *A. arborescens* is seldom truly pendent with hanging leaves. In *A. hardyi* the raceme is only about half the length of that of *A. arborescens* and it is somewhat laxer. The pedicels and flowers are somewhat shorter, but the two species overlap in these characters.

The specific epithet can be traced back to the pre-Linnaean phrase-name *Aloe africana caulescens, foliis glaucis caulem amplexantibus* (Commelijn 1701). The Latin word *arborescens* (= tree-forming) was evidently regarded as a synonym of *caulescens* (= stem-forming), although the plant becomes a large, much-branched shrub rather than a tree. Many common names are recorded for this species, including the following: *inhlazi*, *unhlabana*, *inkalene* (*encane*) (Zulu), *sayyan* (seKone), and *kransaalwyn* (Afrikaans) (Reynolds 1950, 1966; Palmer & Pitman 1972). Although Commelijn gives a picture of his plant, which is cited by Miller (1768), it is at best difficult to identify Commelin's seedling with any particular species of *Aloe*. Accordingly, a neotype is chosen to stabilise current usage.

Leaf pulp of this species was tested for use in the treatment of X-ray burns. Although Reynolds (1950) reported that initial results were encouraging, nothing seems to have come of this. Several tribal uses have been recorded for this species, of which the most conspicuous is as living fences around kraals. In the Eastern Cape, kraals abandoned within about 50 years, are easily visible because of the remains of hedges of this species.

Vouchers: *Acocks 10474* (BOL, PRE); *Culverwell 815* (PRE); *Dyer 3443* (PRE); *Reynolds 1290* (PRE); *Ward 4192* (PRE).

Hybrids:

1. *A. arborescens* × *A. chortolirioides* var. *chortolirioides* (no. 9a). See *A. chortolirioides* var. *chortolirioides*.

2. *A. arborescens* × *A. nubigena* (no. 13). See *A. nubigena*.

3. *A. arborescens* × *A. pratensis* (no. 35). See *A. pratensis*.

4. *A. arborescens* × *A. lineata* var. *lineata* (no. 38a). See *A. lineata* var. *lineata*.

5. *A. arborescens* × *A. maculata* (no. 45). See *A. maculata*.

6. *A. arborescens* × *A. cryptopoda* (no. 77). See *A. cryptopoda*.

7. *A. arborescens* × *A. succotrina* (no. 91). See *A. succotrina*.

8. *A. arborescens* × *A. speciosa* (no. 98) (= *A. × drepanophylla* Baker). Voucher: *Cooper s.n.* (K).

9. *A. arborescens* × *A. marlothii* var. *marlothii* (no. 104a). Vouchers: *King 47* (PRE); *Reynolds 1315* (BOL); *F.Z. van der Merwe 308* (PRE).

10. *A. arborescens* × *A. ferox* (no. 110) (= *A. × sahndyckiana* Schult. & Schult.f.). Vouchers: *Berger s.n.* (K); *Pillans 967* (BOL, GRA); *Marloth 5492* (PRE); *Pole Evans 166* (BM, PRE); *Sparks s.n.* (PRE).

97. *Aloe pluridens* Haw. in The Philo-sophical Magazine 64: 299 (1824); Baker: 322 (1896a); A.Berger: 294 (1908); Marloth: 76 (1915); Pole Evans: t. 610 (1936k); Reynolds: 415 (1950); Jeppe: 47 (1969); Bornman & D.S.Hardy: 225 (1972); Glen & G.F.Sm.: 41 (1995); B.-E. van Wyk & G.F.Sm.: 60 (1996). Neotype: Eastern Cape, near Fort Beaufort, *Reynolds 1419* (PRE!).

A. atherstonei Baker: 170 (1880a). Type: Eastern Cape, no precise locality, *Atherstone s.n.* (K).

A. pluridens Haw. var. *beckeri* Schönland: 43 (1903). Type: Hort. (?) Mauritius, *Becker s.n.* (GRA!).

Plants arborescent, 2–3(–5) m tall; stems with few branches, rarely simple. *Leaves* 30–40 per rosette, spreading to recurved, 450–700 × 35–60 mm, pale green to yellow-green, obscurely lined. *Inflorescences* dense, conical racemes with up to 4 branches, 0.8–1.0 m tall, without sterile bracts below first branch; bracts ovate-acute to obovate-obtuse, 15–20 × 6–12 mm, many-nerved. *Flower* salmon-pink to scarlet, 35–45 mm long; pedicels 17–35 mm long. *Anthers* exerted up to 4 mm. *Ovary* 6–11 × 2–4 mm, green; style exerted up to 8 mm. *Fruit* ± 20 × 11 mm, yellow-brown. *Flowering time* May to June.

Aloe pluridens is found in KwaZulu-Natal and the Eastern Cape. Near the southern Cape coast it usually occurs on relatively deep sandy soil in valley bushveld. In this area rain may

fall at any time, with a summer maximum, and the average annual rainfall is relatively low. Map 67.

This species is taller and more sparsely branched than *A. arborescens* (no. 96). The leaves are narrower and more yellowish green, and the racemes are laxer, narrower and more acute than those of *A. arborescens*. The leaf teeth are pinkish white, not glaucous white, and the leaf sap has a distinctive sharp odour. The only other tall, single-stemmed *Aloe* in the range of *A. pluridens* is *A. ferox* (no. 110), which is a much stouter plant with broader, firmer leaves and dense subcylindric racemes of subsessile flowers.

The 'many-toothed tree-aloe' has leaves in which the teeth are somewhat more distinct than in *A. arborescens*, hence the Latin and English names given by Haworth. Common names recorded for this species include French aloe, *fransaalwyn* (Afrikaans) and *garaa* (Khoi) (Palmer & Pitman 1972).

Vouchers: Bayliss *BRI-B226* (PRE); MacOwan *1825* (BM, GRA, K, SAM); Marloth *5137* (PRE); Paterson *69* (PRE); Reynolds *2386* (PRE).

Hybrid:

A. pluridens × *A. ferox* (no. 110). Voucher: Reynolds *1424* (BOL, PRE).

19. Section **Principales**

Section **Principales** (*A.Berger*) Glen & D.S.Hardy, stat. nov. Type species: *A. speciosa* Baker.

Series *Principales* A.Berger in Botanische Jahrbücher 36: 48 (1905a); A.Berger: 296 (1908); Reynolds: 422 (1950).

Plants arborescent, 3–4(–6) m tall; stems simple or branched, rosettes usually tilted slightly sideways. *Leaves* many, rosulate, erect to spreading, 400–800 × 40–95 mm, slightly channelled to D-shaped in section, green to glaucous green with bluish to reddish tinge, margins with minute distant pink teeth. *Inflorescence* a simple, very dense, cylindric, arcuate-erect raceme ± 500 mm long; peduncle with many sterile bracts; bracts broadly ovate-acute, 10–20 × 8–11 mm, 7–many-nerved. *Flowers* red in bud, greenish white at flowering, cylindric-ventricose, 22–35 mm long; outer segments free almost to base, inner segments free; pedicels 3–10 mm long. *Anthers* exerted 9–16 mm. *Ovary* 5–6 × 2–4 mm, green; style exerted 10–16 mm. *Fruit* not seen. *Flowering time* August to September.

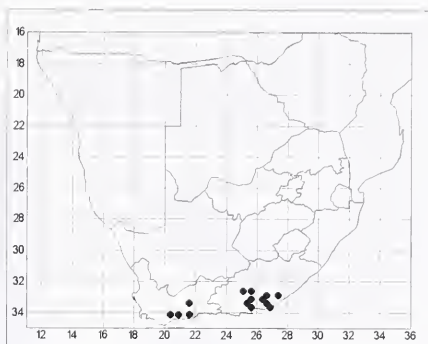
98. *Aloe speciosa* Baker in Journal of the Linnean Society of London, Botany 18: 178 (1880a); Baker: 323 (1896a); A.Berger: 299 (1908); Pole Evans: t. 606 (1936); Reynolds: 422 (1950); Jeppe: 43 (1969); Bornman & D.S.Hardy: 231 (1972); Palmer & Pitman: 377 (1972); B.-E. van Wyk & G.F.Sm.: 66 (1996). Type: Eastern Cape, near Fish River, MacOwan 1922 (K, holo.!, PRE, photo.!).

Description as for section. Figure 19.

Aloe speciosa occurs mainly in noorsveld, but also in valley bushveld and fynbos, on very stony ground in the Western and Eastern Cape. Its range is mostly in the drier parts of the region where rain occurs in all seasons, with a summer maximum in the east. Map 69.

In this very distinctive species the rosette of leaves is slightly oblique, a character not found in any other southern African single-stemmed *Aloe*. The leaves have very fine pink to red margins with the finest teeth of all arborescent aloes, and the simple inflorescences with cylindric, very dense, bicoloured racemes are other very distinctive characters. *A. rubroviolacea* (indigenous to Yemen) also has oblique leaf rosettes and inflorescences with very dense racemes, but the plant is shorter and the racemes are unicoloured.

The Latin word *speciosus* means 'showy' or 'beautiful', and is an apt description of the inflorescence of this aloe. Palmer & Pitman



MAP 69.—*Aloe speciosa*

(1972) record the following common names for this species: *slapoor*, *slaphoringaalwyn*, *spanaalwyn* and *spanareaalwyn* (all Afrikaans).

Vouchers: Bayliss 6056 (PRE); Marloth 13125 (PRE); Muir 1750 (PRE); Reynolds 2619 (PRE); Thode A2773 (NH, PRE).

Hybrids:

1. *A. speciosa* × *A. arborescens* (no. 96). See *A. arborescens*.

2. *A. speciosa* × *A. africana* (no. 109). Voucher: Jolinson 660 (PRE).

3. *A. speciosa* × *A. ferox* (no. 110) (= *A. × tomlinsonii* Marloth). Vouchers: L. Bolus NBG1615/32 (NBG); Tomlinson in Marloth 13691 (PRE); Reynolds 1420 (BOL).

20. Section *Anguialoe*

Section *Anguialoe* Reynolds in Journal of South African Botany 6: 111 (1940b); Reynolds: 428 (1950). Type species: *A. spicata* L.f. (= *A. sessiliflora* Pole Evans).

Plants short-stemmed to arborescent; stems simple or branched. *Leaves* densely rosulate, narrowly deltoid to ensiform, margins dentate. *Inflorescence* a simple cylindric, very dense raceme, 1–5 per rosette; peduncles with many sterile bracts. *Flowers* sessile or subsessile, spreading, campanulate; segments free. *Anthers* exerted for ± half their total length. *Style* exerted for ± half its total length.



C. Letty del.

FIGURE 19.—Section Principales. *Aloe speciosa*: 1, median longitudinal section of flower; 2, bract; 3 & 4, flower buds; 5, open flower; 6, cross section of leaf; 7, portion of leaf margin; 8, habit. Taken from Pole Evans (1936l).

- 1a Plants up to 2 m tall, may be almost stemless:
 2a Leaves flat; racemes over 50 mm in diameter 99. *A. vryheidensis*
 2b Leaves channelled; racemes less than 50 mm in diameter 100. *A. spicata*
 1b Adult plants over 2 m tall; stems conspicuous, branched or unbranched:
 3a Stem unbranched; leaves recurved; inflorescence up to 1.3 m tall 101. *A. alooides*
 3b Stem branched above ground; leaves ascending to spreading; inflorescence 1.5 m tall
 or more 102. *A. castanea*

This section is characterised by the inflorescences, which are simple and relatively long, with narrowly cylindric racemes. The flowers are sessile or subsessile and campanulate with free segments, long-exserted anthers and styles, and copious nectar.

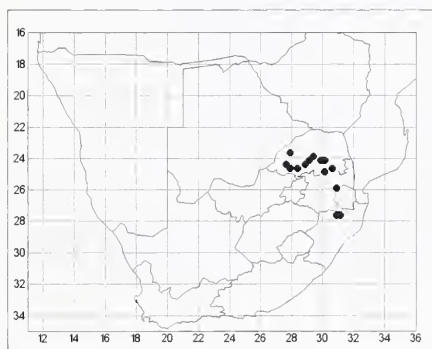
99. **Aloe vryheidensis** Groenew. in Tydskrif vir Wetenskap en Kuns 15: 129 (1937c); Reynolds: 111 (1940b); R.A.Dyer: t. 805 (1941); Reynolds: 428 (1950); Jeppe: 107 (1969); Bornman & D.S.Hardy: 233 (1972); B.-E. van Wyk & G.F.Sm.: 70 (1996). Type: KwaZulu-Natal, Heine near Vryheid, F.Z. van der Merwe 266 (PRE!).

A. dolomitica Groenew.: 178 (1938b); Reynolds: 111 (1940b); Reynolds: 434 (1950); Jeppe: 108 (1969); Bornman & D.S.Hardy: 239 (1972); Palmer & Pitman: 379 (1972). Type: Mpumalanga, Strydpoort Mts, F.Z. van der Merwe 235 (PRE!).

Plants almost stemless to arborescent, 1–2 m tall; stems simple. *Leaves* 20–50, ascending to arcuate-incurved, flat, 400–800 × 80–130 mm, dark green to glaucous green. *Inflorescences* 2–3(–5) per rosette, 0.6–1.5 m tall, over 50 mm in diameter; bracts ovate-acute, 8–15 × 5–10 mm, 3–5-nerved. *Flowers* sessile, rose or brownish honey-yellow to greenish yellow, 8–20 mm long. *Anthers* exserted 6–15 mm. *Ovary* ± 5–6 × 3 mm, orange; style exserted 7–17 mm. *Fruit* not seen. *Flowering time* July to August.

Aloe vryheidensis is found in the Northern Province, Mpumalanga and KwaZulu-Natal, where it usually occurs on alkaline soils derived from shales or dolomite. The entire range of this species falls within the summer-rainfall region, but rainfall amounts and temperatures vary considerably. Map 70.

In this species the peduncle is more or less oblique, while the raceme is erect. There is thus

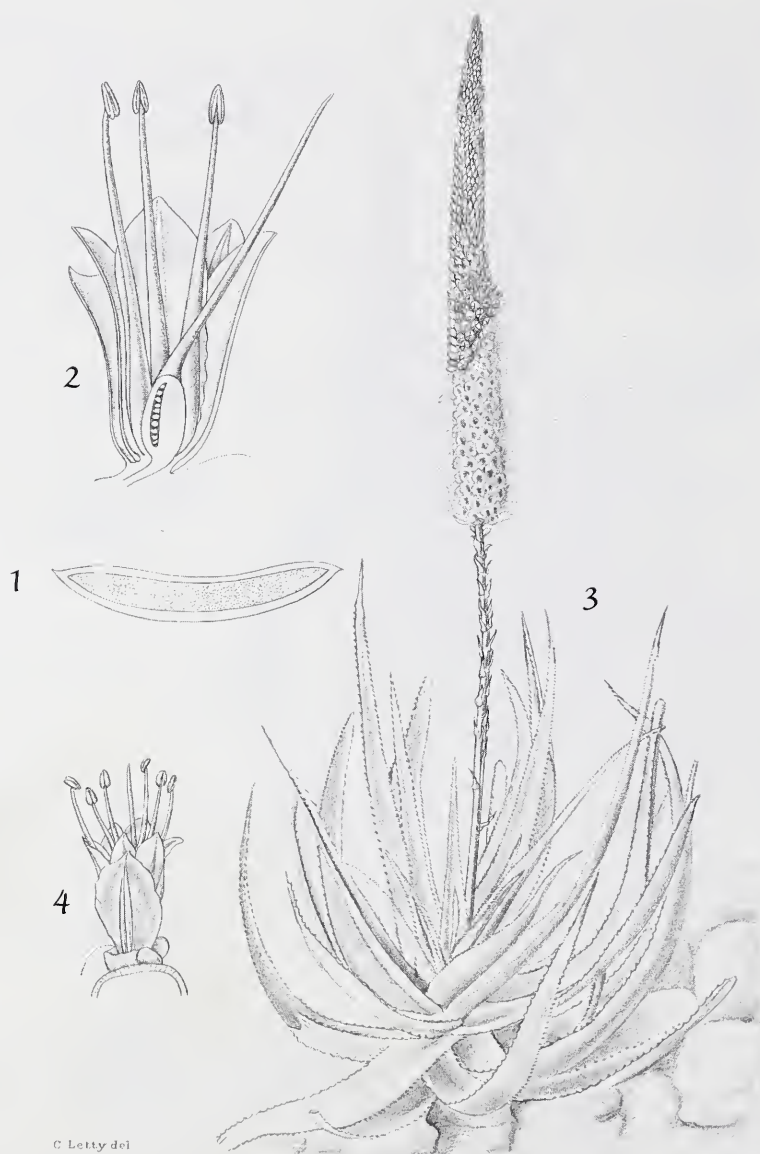


MAP 70.—*Aloe vryheidensis*

a distinct angle at the base of the raceme. The leaves are flat to D-shaped in section and the flowers are pinkish brown. Plants may be stemless or caulescent. In *A. spicata* (no. 100), the only species with which *A. vryheidensis* is likely to be confused, the leaves are channelled, the raceme is narrower and the flowers are greenish yellow.

The specific epithet indicates the type locality, while the synonym and common name indicate the preferred substrate of this aloe; Palmer & Pitman (1972) record the common name dolomite aloe for this species.

Vouchers: Dyer 3501 (PRE); Hardy 40 (PRE); Jacobsen 2939 (PRE); Reynolds 2000 (PRE, SAM); Verdoorn 2522 (PRE).



C. Letty del.

FIGURE 20.—Section *Anguialoe*. *Aloe spicata*: 1, transverse section of leaf; 2, median longitudinal section of flower showing upward inclination of style from apex of ovary $\times 3$; 3, habit, much reduced; 4, flower and attachment to raceme, $\times 1.5$. Taken from Dyer (1931b).

100. *Aloe spicata* L.f., Supplementum plantarum: 205 (1782); Thunb.: 61 (1794); Willd.: 185 (1799); Thunb.: 182 (1800); Haw.: 76 (1812) pro parte; Salm-Dyck: 28 (1817); Haw.: 39 (1821) pro parte; Thunb.: 309 (1823); A.Berger: 304 (1908); N.E.Br.: 142 (1923); Reynolds: 425 (1950); Glen & D.S.Hardy: 99 (1995); B.-E. van Wyk & G.F.Sm.: 86 (1996). Type: southern Africa, no precise locality, *Thunberg 8599* (UPS, holo.!; BM!, PRE!, STE!, photo.).

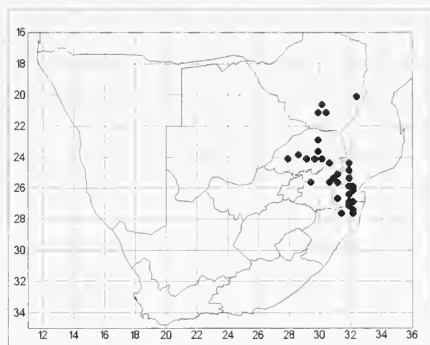
A. sessiliflora Pole Evans: 708 (1917); Pole Evans: t. 180 (1925c); R.A.Dyer: t. 435 (1931b); Reynolds: 111 (1940b); Reynolds: 431 (1950); Jeppe: 106 (1969); Bornman & D.S.Hardy: 235 (1972); Palmer & Pitman: 379 (1972); West: 80 (1974); Compton: 102 (1976). Type: Mpumalanga, Barberton District, *Thorncroft PRE43* (PRE!).

A. tauri L.C.Leach: 363 (1968); West: 79 (1974). Type: Zimbabwe, Mt Igar, *Leach & Bullock 13321* (SRGH, holo.!; BM, G, K!, LISC, PRE!).

Plants almost stemless to arborescent, 1–2 m tall; stems simple or branched. *Leaves* \pm 30 per rosette, spreading to slightly recurved, 500–700 \times 50–95 mm, channelled, green to reddish. *Inflorescences* 1–5 per rosette, 0.6–1.2 m tall, less than 50 mm in diameter; bracts ovate-acute, 10–11 \times 5–7 mm, 3–5-nerved. *Flowers* sessile, brownish red in bud, greenish yellow to almost white at flowering, 7–15 mm long. *Anthers* exserted 5–15 mm. *Ovary* \pm 4.0–5.0 \times 2.5 mm, orange; style exserted 3–15 mm. *Fruit* \pm 13 \times 6 mm, almost black. *Seeds* \pm 2.0 \times 1.25 \times 0.7 mm, black, without wings. *Flowering time* June to August. Figure 20.

Aloe spicata occurs on a wide variety of soils at high and low altitudes on the Northern Province and Mpumalanga highveld and lowveld and adjacent areas of southern Zimbabwe, Swaziland and the Mozambique and KwaZulu-Natal coastal plain. Temperatures are generally high, with variable amounts of summer rain. Map 71.

Differences between *A. spicata* and *A. vryheidensis* (no. 99) are discussed under that species. This pair is unlikely to be confused with any other aloe. The salient differences between *A. tauri* and *A. spicata* mentioned in the first



MAP 71.—*Aloe spicata*

description of the former were dimensions and ratios of dimensions in the inflorescence and of the leaves. In almost all of these, there was at least some overlap, the only exception being in Leach's measurements of the raceme length and hence of the raceme:peduncle ratio. Reynolds's (1950: 431) and our measurements indicate that here, too, there is overlap.

The specific epithet highlights the spicate inflorescence.

Vouchers: *Compton 27909* (NBG, PRE); *Hardy & Scott 1522* (PRE); *Mogg 16636* (PRE); *Reynolds 1985* (PRE, SAM); *Ward 4186* (PRE).

Hybrids:

1. *A. spicata* \times *A. greatheadii* var. *davyana* (no. 46b). See *A. greatheadii* var. *davyana*.

2. *A. spicata* \times *A. marlothii* var. *marlothii* (no. 104a). Voucher: *Reynolds 1916* (PRE).

3. *A. spicata* \times *A. aculeata* (no. 105). Voucher: *Bey 7* (SRGH).

101. *Aloe alooides* (Bolus) Druten in Bothalia 6: 544 (1956); Jeppe: 109 (1969); Bornman & D.S.Hardy: 243 (1972); Palmer & Pitman: 380 (1972); B.-E. van Wyk & G.F.Sm.: 44 (1996). Type: Mpumalanga, near Mac-Mac,

MacLea BOL3011 (BOL, holo.!; K!, SAM!; PRE, photo.).

Urginea alooides Bolus: 395 (1881). *Notosceptrum alooides* (Bolus) Benth.: 775 (1883); Baker: 285 (1896b).

A. recurvifolia Groenew.: 39 (1935); Reynolds: t. 601 (1936k); Reynolds: 111 (1940b); Reynolds: 436 (1950). Neotype: Mpumalanga, near Graskop, F.Z. van der Merwe 73 (PRE!, designated by Reynolds 1950).

Trees 2–4 m tall; stems usually simple, rarely branched near base. *Leaves* many, recurved, 600–1300 × 70–180 mm, deeply channelled, olive-green, sometimes slightly reddish. *Inflorescence* simple, 3–5 simultaneously, up to 1.3 m tall; bracts ovate-acute, 5–8 × 3–5 mm, 3–5-nerved. *Flowers* sessile, lemon-yellow, 8–10 mm long. *Anthers* exerted 3–7 mm. *Ovary* ± 3 × 3 mm, orange; style exerted 3–8 mm. *Fruit* ± 9 × 7 mm. *Flowering time* July to August.

Aloe alooides grows in shallow soil on dolomite outcrops in a limited area of the Mpumalanga escarpment. It sometimes occurs in association with *Encephalartos humilis*. The summers in this area are warm and rainy, the winters dry and cold. Map 72.

The flowers of this species are the smallest in the entire genus, and plants are the slowest-growing. Among the species of this section, this species stands out because of its deeply channelled, sharply recurved leaves and very long, narrow inflorescences.



MAP 72.—*Aloe alooides*

The specific epithet highlights the confusion surrounding the identity of this plant when it was discovered. The type specimen is an inflorescence with neither leaves nor notes on leaves and habit, and so it was first placed in the genus *Urginea*, a group of small, inconspicuous bulbous plants. The name first given to it means 'the *Urginea* that looks like an *Aloe*'. The combination *Aloe alooides* had to be used when it was realised that this plant was, in fact, an *Aloe*, and so the present name means 'the *aloe* that looks like an *aloe*'.

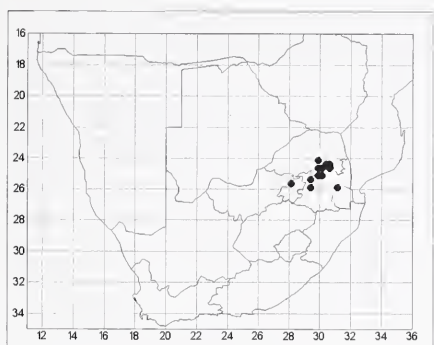
Voucher: *Reynolds 1459* (PRE).

102. *Aloe castanea* Schönland in Records of the Albany Museum 2: 138 (1907); A. Berger: 330 (1908); Reynolds: 111 (1940b); Reynolds: 438 (1950); Jeppe: 109 (1969); Bornman & D.S. Hardy: 245 (1972); Palmer & Pitman: 380 (1972); B.-E. van Wyk & G.F.Sm.: 76 (1996). Type: Mpumalanga, Ohrigstad Valley, Burt Davy 2856 (GRA!).

Trees 2–4 m tall; stems branched. *Leaves* many per rosette, ascending to spreading, 500–1000 × 50–100 mm, channelled, glaucous. *Inflorescence* simple, 1–5 per rosette, 1.5–2.0 m tall; bracts 8–14 × 5–8 mm, 3–5-nerved. *Flowers* chestnut-brown, 15–18 mm long; pedicels up to 3 mm long. *Anthers* exerted 4–15 mm. *Ovary* 4–7 × 2–3 mm, deep orange; style exerted 6–15 mm. *Fruit* 11–15 × 7–8 mm, olive-brown. *Seeds* ± 4.0 × 1.75 × 1.25 mm, ochre. *Flowering time* July to August.

Aloe castanea occurs in hot, dry thorny woodland (mostly Acocks's (1988) Mixed Bushveld and Sourish Mixed Bushveld) on the highveld side of the Mpumalanga escarpment (Gauteng, Mpumalanga and the Northern Province and Swaziland) on a variety of soils. Map 73.

This is the only species of the section in which the stems are often branched, and plants may occasionally form much-branched trees. The racemes are rarely rigidly erect as they are in other species of this section, being usually

MAP 73.—*Aloe castanea*

oblique, bent (simply or with an S-bend) or twisted. The flowers are subsessile, with pedicels up to 3 mm long; in other species in this section the flowers are completely sessile.

The Latin word *castaneus* means 'chestnut-coloured' and refers to the flowers of this species. The seKone common names *borolo* and *suwopa* are recorded for this species (Reynolds 1950). The leaf ash prepared from this species is used as a weevil-repellent preservative for stored grain in Sekhukhuneland (Reynolds 1950).

Vouchers: *Barnard & Mogg 1006* (PRE); *Dahlstrand 1866* (PRE); *Henderson 1738* (NBG); *Reynolds 2471* (PRE).

Hybrids:

1. *A. castanea* × *A. greatheadii* var. *davyana* (no. 46b). See *A. greatheadii* var. *davyana*.

2. *A. castanea* × *A. cryptopoda* (no. 77). See *A. cryptopoda*.

3. *A. castanea* × *A. aculeata* (no. 105). Voucher: *E.R. Harrison s.n.* (PRE).

21. Section **Ortholophae**

Section **Ortholophae** (*Christian*) *Glen & D.S.Hardy*, stat. nov. Type species: *A. secundiflora* Engl.

Subsection *Ortholophae* Christian in *Journal of South African Botany* 6: 188 (1940b).

Plants stemless to arborescent, solitary with simple or branched stems, or suckering to form small or large groups. *Leaves* rosulate, deltoid to lanceolate, arcuate-incurved to spreading, green to glaucous, unspotted, margins dentate, surfaces sometimes with irregular prickles. *Inflorescences* simple or branched, erect to horizontal, lax to dense, usually secund, rarely cylindric racemes; peduncles usually without sterile bracts except those subtending branches, rarely few sterile bracts present. *Flowers* cylindric-trigonous, cylindric, clavate or ventricose; outer segments shortly connate, inner segments usually dorsally adnate to outer, sometimes completely free; pedicels short. *Anthers* variously exserted. *Style* variously exserted.

Plants stemless; racemes lax to sublax (peduncle visible between flowers) . . . 103. *A. globuligemma*
Plants caulescent; racemes dense (peduncle not visible between flowers) 104. *A. marlothii*

The secund racemes are a certain indicator of this section, except in some populations of *A. marlothii* in KwaZulu-Natal, where the racemes may be cylindric. Species of this group are stemless and suckering to caulescent and solitary, with leaves with or without surface prickles. The racemes are lax to very dense, and the inflorescence may be simple or with few to many branches. In the southern African species of this section the anthers and styles are long-exserted. In *Aloe*, the second flowers point upwards, but in species of *Kniphofia* with secund flowers, the flowers point obliquely downwards.

103. *Aloe globuligemma* Pole Evans in Transactions of the Royal Society of South Africa 5: 30 (1915); Pole Evans: t. 2 (1921c); Christian: 188 (1940b); Reynolds: 443 (1950); Reynolds: 223 (1966); Jeppe: 6 (1969); Bornman & D.S.Hardy: 247 (1972); West: 74 (1974); B.-E. van Wyk & G.F.Sm.: 138 (1996). Type: Hort. Pretoria, Pole Evans 20 (PRE!).

Plants stemless, 400–600 mm tall excluding inflorescence, suckering and forming large dense groups. Leaves ± 20 per rosette, erectly spreading to slightly incurved, with recurved apices, 400–600 \times 55–90 mm. glaucous. Inflorescence of lax, secund racemes, with 8–18 horizontal to ascending branches, up to 1 m tall; bracts ovate-acute to lanceolate-acute, 3–8 \times 3–4 mm, 3–5-nerved. Flowers deep dull red in bud, sulphur-yellow to ivory-coloured at flowering, 18–26 mm long; outer segments connate in basal third, inner segments free; pedicels 2–5 mm long. Anthers exserted 5–12 mm. Ovary $\pm 6 \times 2$ mm; style exserted 5–14 mm. Fruit $\pm 25 \times 13$ mm. Flowering time July to August.

This species occurs on stony soil in hot, dry, thorny bushveld in Botswana, the Northern Province and Mpumalanga; also in southern Zimbabwe. Map 74.

Aloe globuligemma is similar to *A. guerrae* and *A. procera* (both indigenous to Angola), *A.*

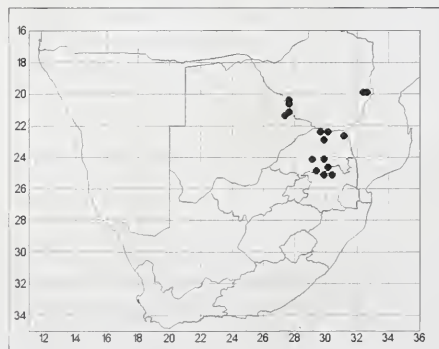
ortholopha (indigenous to Zimbabwe) and *A. mawii* (indigenous to Malawi and Mozambique). In *A. guerrae* the flowers are somewhat laxer than in *A. globuligemma*, the inflorescences are much taller and plants are solitary, not forming great masses. In *A. procera* the inflorescences are laxer and taller than in *A. globuligemma*, and the flowers do not change colour as they age. Plants of *A. ortholopha* are solitary, with very dense, unicoloured racemes in inflorescences which are only once or twice branched, and flowers on much longer pedicels than those of *A. globuligemma*. *A. mawii* is shortly (1–2 m) caulescent and has simple, very dense racemes in which the bracts are very small and obscurely veined. In *A. globuligemma*, unlike all the other members of this section, the flowers are clavate.

The specific epithet is composed of two Latin words, *globulus* a 'small ball' or 'cluster', and *gemma* a 'bud' or 'jewel', an allusion to the round buds. The seKone common name for this species is *lekopane* (Reynolds 1950). In Sekhukhune land this species is considered to be an aid to long-term weather forecasting. When the terminal raceme points eastwards, this indicates that the following rainy season will be poor, while a westward-pointing terminal raceme indicates good rains to come (Reynolds 1950). Plants in cultivation both in Pretoria and Johannesburg generally had terminal racemes pointing close to due north in both good and poor rain years. The inflorescences of cultivated plants of this species in the Pretoria National Botanical Garden are avidly eaten by rock hyrax (dassies, *Procavia capensis*). West (1974: 75) reports that the leaves contain a water-soluble toxic principle which has been implicated in some cases of culpable homicide.

Vouchers: Ellery 238 (PRE); Leach 11127 (MO, PRE, SRGH); Pole Evans 221 (BM, PRE); Reynolds 5475 (BOL, PRE, SAM); Van Vuuren 1538 (PRE).

Hybrid:

A. globuligemma \times *A. aculeata* (no. 105). Voucher: Leach 9251 (SRGH).



MAP 74.—*Aloe globuligemma*

104. **Aloe marlothii** A.Berger in Botanische Jahrbücher 38: 87 (1905b); A.Berger: 312 (1908); J.M.Wood: t. 579 (1912); N.E.Br.: t. 8484 (1913); Marloth: 102b (1915); Sim: 151 (1919); Pole Evans: t. 171 (1925d); Reynolds: 7 (1935); Reynolds: 479 (1950); Jeppe: 36 (1969); Bornman & D.S.Hardy: 271 (1972); Palmer & Pitman: 390 (1972); Compton: 100 (1976); B.-E. van Wyk & G.F.Sm.: 58 (1996). Type: Botswana, near Lobatse, *Marloth 3325* (B, holo.; PRE!, BOL! [= *BOL24327*]).

A. supralaevis Haw. var. *hanburyi* Baker: 327 (1896a). Type: Hort. La Mortola, *Hanbury s.n.* (K!).

A. ferox Mill. var. *xanthostachys* A.Berger: 310 (1908). Type: KwaZulu-Natal, Ladysmith, *Marloth 4157* (B).

A. marlothii A.Berger var. *bicolor* Reynolds: 34 (1936f); Reynolds: 482 (1950). Type: Mpumalanga, Barberton, *Reynolds 1440* (PRE, holo.; BOL!).

A. spectabilis Reynolds: 129 (1937e); Reynolds: 477 (1950); Jeppe: 38 (1969); Bornman & D.S.Hardy: 269 (1972); Palmer & Pitman: 389 (1972). Type: KwaZulu-Natal, Tugela Ferry, *Reynolds 2033* (PRE, holo.; BOL!).

Trees 2–4(–10) m tall; stems simple. *Leaves* 40–50, arcuate-incurved to spreading or slightly recurved with age, 750–1500 × 75–250 mm, channelled to D-shaped in section, glaucous, usually with irregular prickles on both surfaces, these normally fewer on upper surface. *Inflorescence* of spreading to rarely erect, usually secund, rarely cylindric racemes, with up to 30 branches; bracts ovate-acute, 4–9 × 2–5 mm, 3–5-nerved. *Flowers* yellow to red in bud, yellow to orange at flowering, cylindric to ventricose, 22–35 mm long; outer segments connate for one third to half their length, inner segments adnate to outer in basal third; pedicels 3–5 mm long. *Anthers* exerted 8–20 mm. *Ovary* 5.0–9.0 × 1.5–5.0 mm, green; style exerted 6–20 mm. *Fruit* 19–21 × 10–12 mm, grey.

Aloe marlothii characteristically grows on rocky hills on the highveld of the Northern Province, Mpumalanga and Gauteng, but may occur in a wide variety of habitats elsewhere. The vegetation and climate vary considerably across its range. Records of this species from

Zimbabwe and Malawi (e.g. Jeppe 1969: 36) are probably based on misidentifications of *A. excelsa* (no. 115), which appears similar when not in flower or fruit.

This species and *A. mawii* are the only arborescent members of this section. In *A. marlothii* the inflorescence is a much-branched panicle with up to 30 racemes of orange to yellow flowers subtended by bracts 4–9 mm long. In *A. mawii* the inflorescence is a simple raceme of red to orange flowers subtended by minute bracts no more than 1 mm long. The leaves of *A. excelsa* are slightly shorter, narrower and more spreading than those of *A. marlothii*, tend to be slightly more purplish in colour when affected by cold, and have somewhat inrolled margins.

Two subspecies are recognised:

- Stems solitary, taller than 2 m; leaves
with many surface prickles
. 104a. subsp. *marlothii*
Stems in clumps, shorter than 2 m; leaves
with few surface prickles
. 104b. subsp. *orientalis*

104a. subsp. **marlothii**.

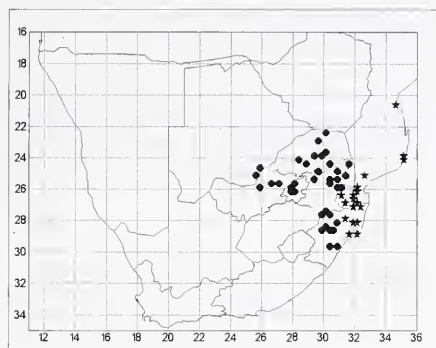
Description as for species. *Flowering time* June to August.

Found in Botswana, the Northern Province, North-West, Gauteng, Mpumalanga, Swaziland and KwaZulu-Natal. Map 75.

The specific epithet honours the discoverer, H.W.R. Marloth (1855–1931), pharmacist, analytical chemist and botanist. Marloth's collections and publications are among the most important of his period for the study of southern African botany. Many common names are recorded for this species, including the following: mountain aloe, *bergaalwyn* (Afrikaans), *inhlaba* (siSwati), *bindamutsho* and *khopha* (Tshivenda), *unhlaba*, *inhlaba*, *ikhala* and *inhlabane* (Zulu) and *ngopa nara* (seKone) (Reynolds 1950; Palmer & Pitman 1972).



FIGURE 21.—Section *Ortholophae*. *Aloe marlothii* subsp. *orientalis*: 1, leaf apex, $\times 0.8$; 2, one raceme, $\times 0.8$; 3, fruit, $\times 0.8$. Taken from Glen & Hardy (1987c).



MAP 75.—● *Aloe marlothii* subsp. *marlothii*
★ *A. marlothii* subsp. *orientalis*

Aloe marlothii subsp. *marlothii* is eaten by eland in the Pietersburg Game Reserve (G. Bredenkamp pers. comm.). Small plants are browsed as they are found, but the animals push over large individuals to reach the crowns. The baKgatla use the leaf boiled in water with sugar as a tapeworm remedy (Watt & Breyer-Brandwijk 1963). The same authors report that this species contains the same carcinogens as cigarette smoke. The leaves are widely used to scrape hides and thin them for use as clothing. Ash from burned dry leaves is used to adulterate snuff. The Zulu use a decoction of green leaves and roots against roundworm, and a decoction of the shoots for digestive troubles. The leaf sap is rubbed on a mother's breasts to hasten weaning.

Vouchers: *Acocks* 10526 (NH, PRE); *Buitendag* 567 (NBG, PRE); *H. Hall* 927 (MO); *Moll* 3292 (PRE); *Story* 5641 (PRE).

Hybrids:

1. *A. marlothii* subsp. *marlothii* × *A. greatheadii* var. *greatheadii* (no. 46a). See *A. greatheadii* var. *greatheadii*.

2. *A. marlothii* subsp. *marlothii* × *A. cryptopoda* (no. 77). See *A. cryptopoda*.

3. *A. marlothii* subsp. *marlothii* × *A. arborescens* (no. 96). See *A. arborescens*.

4. *A. marlothii* subsp. *marlothii* × *A. spicata* (no. 100). See *A. spicata*.

5. *A. marlothii* subsp. *marlothii* × *A. aculeata* (no. 105). Voucher: *Reynolds* 1366 (PRE).

6. *A. marlothii* subsp. *marlothii* × *A. ferox* (no. 110). Vouchers: *Moll* 3287A–D (NU).

7. *A. marlothii* subsp. *marlothii* × *A. angelica* (no. 111). Voucher: *Reynolds* 1382 (BOL, PRE).

8. *A. marlothii* subsp. *marlothii* × *A. rupestris* (no. 112). Voucher: *Henderson* 1752 (NBG).

104b. subsp. *orientalis* *Glen & D.S.Hardy* in *The Flowering Plants of Africa* 49: t. 1943 (1987c). Type: KwaZulu-Natal, Mtunzini District, *Plowes* 2260 (PRE, holo.!; LISC!, SRGH!).

Plants caulescent, 1.0–1.75 m tall, suckering to form small groups. *Leaves* glaucous to blue-green, with no to few surface prickles. *Flowers* somewhat shorter than in subsp. *marlothii*. *Anthems* exerted 8–12 mm. *Style* exerted 8–12 mm. *Flowering time* July to August. Other characters as in subsp. *marlothii*. Figure 21.

Found in Swaziland and KwaZulu-Natal; also in Mozambique. The first two vouchers cited are from Mozambique; the type is among the few known gatherings from southern Africa. Map 75.

This subspecies suckers when growing in sandy soil, while subsp. *marlothii* does not form clumps. Unlike subsp. *marlothii*, this subspecies can grow on beach sand, and generally favours sandier soils at lower altitude than the typical subspecies. *A. marlothii* subsp. *orientalis* is characterised by no or few surface prickles on the leaves, shorter stems than the typical subspecies and racemes which are usually oblique rather than usually horizontal.

The subspecific epithet (Latin *orientalis* = eastern) indicates that the natural range of

this subspecies lies to the east of the range of the typical one. Anderson & Pooley (1977) record that leaves of *A. marlothii* are rarely eaten by nyala (*Tragelaphus angasi*) in the Ndumu Game Reserve. They probably refer to the subsp. *orientalis*, which seems to be

fairly common in that reserve (HFG, sight record).

Vouchers: Jansen & De Koning 7311 (MO); Leach 11129 (PRE); Pooley 643 (NH); C.J. Ward 2645 (NH, PRE); M.C. Ward 1049 (PRE).

22. Section **Pachythamnos**

Section **Pachythamnos** Glen & D.S.Hardy, sect. nov. Type species: *A. petricola* Pole Evans.

Plantae acaulescentes; inflorescentia simplice vel parce ramosa; racemis cylindricis vel subcylindricis; bracteis angustis; floribus subsessilibus.

Plants stemless or short-stemmed, not suckering. *Leaves* rosulate, deltoid to lanceolate, spreading to arcuate-incurved, green to glaucous, unspotted, margins dentate. *Inflorescence* simple or with few branches; peduncles with sterile bracts; racemes erect to decurved, conical to cylindric, dense; pedicels short. *Flowers* cylindric-trigonous to ventricose, straight or curved; outer segments connate in lower half, inner segments free or adnate to outer. *Anthers* long-exserted. *Style* long-exserted.

1a Perianth mouth upturned:

2a Pedicels longer than 4 mm; plants from KwaZulu-Natal 108. *A. gerstneri*

2b Pedicels shorter than 4 mm; plants from Mpumalanga, Swaziland or Northern Province
. 106. *A. petricola*

1b Perianth mouth straight or downturned:

3a Leaves with random surface prickles throughout 105. *A. aculeata*

3b Leaves with no or few prickles in median line 107. *A. reitzii*

At first sight some species of this section may appear to belong to section 13, *Latebracteatae*. In this section the inflorescences are simple to much more sparsely branched than in that section and the bracts are shorter and significantly narrower than in that section. Flowers in this section are subsessile to shortly pedicellate, not long-pedicellate, and have long-exserted anthers and styles. No member of section *Latebracteatae* has leaves with prickles resembling those of *A. aculeata*.

The name of this section is formed from the Greek words *pachys* meaning 'thick', and *thamnos* for 'shrub', by analogy with section 23, *Pachydendron*. This section differs from that chiefly in being stemless or short-stemmed rather than tree-like.

105. ***Aloe aculeata*** Pole Evans in Transactions of the Royal Society of South Africa 5: 34 (1915); Pole Evans: t. 371 (1930); Reynolds: 447 (1950); Reynolds: 241 (1966); Jeppe: 1 (1969); Bornman & D.S.Hardy: 249 (1972); West: 77 (1974); B.-E. van Wyk & G.F.Sm.: 122 (1996). Lectotype: Northern Province, near Pietersburg, *Pole Evans PRE55* (PRE!), designated by Reynolds 1966).

Plants stemless, 300–600 mm tall excluding inflorescence, solitary. *Leaves* \pm 30, 250–600 \times 50–120 mm, shallowly channelled, grass-green to glaucous, upper surface with few prickles, lower surface with many prickles, these on both surfaces scattered, dark brown, arising from white tubercles. *Inflorescence* of erect, cylindric, very dense racemes, 2–4-branched, \pm 1 m tall; bracts ovate-acuminate, 6–10 \times 4–7 mm.

many-nerved. *Flowers* reddish orange to yellow in bud, orange to yellow at flowering, 23–40 mm long, mouth straight; outer segments connate for less than half their length, inner segments free; pedicels 2–7 mm long. *Anthers* exserted 7–15 mm. *Ovary* 4.0–6.0 × 1.5–3.0 mm, green; style exserted 7–18 mm. *Fruit* ± 18–10 mm. *Flowering time* (May to) June to August.

Aloe aculeata occurs in warm parts of the highveld and the Limpopo valley of the Northern Province and Mpumalanga; also in similar parts of southern and central Zimbabwe and Mozambique. Its habitat varies from rocky outcrops in grassland to dry sandy bushveld. Map 76.

Reynolds (1966) states that the Zimbabwe form of this species may be distinguished from the South African form by having leaf prickles arising from white tubercular bases. Plants from the Northern Province (north of the Soutpansberg) match the Zimbabwean form, both in the field and in cultivation. The presence of irregularly scattered prickles, not in a median line, on the leaf surfaces distinguishes this species from all others in the section. *A. aculeata* differs from *A. petricola* (no. 106) in having many-nerved, not 3–5-nerved, bracts which are shorter than in the latter species. The pedicels and flowers in *A. aculeata* tend to be longer than those of *A. pet-*

ricola, though there is overlap in these characters.

The specific epithet (Latin *aculeatus* = prickly) highlights the fact that this is the only species in the section with leaves with surface prickles. The seKone common names *ngopani* and *sekope* have been recorded for this species (Reynolds 1950). A drawing of *A. aculeata* was part of the reverse design of the South African 10c piece from 1965 to 1989 (Letty 1966).

Vouchers: *Codd* 2902 (PRE); *Liebenberg* 2559 (PRE); *Marloth* 7332 (PRE); *Reynolds* 5566 (MO, PRE, SAM, SRGH); *Van der Schijff* 3876 (PRE).

Hybrids:

1. *A. aculeata* × *A. spicata* (no. 100). See *A. spicata*.

2. *A. aculeata* × *A. castanea* (no. 102). See *A. castanea*.

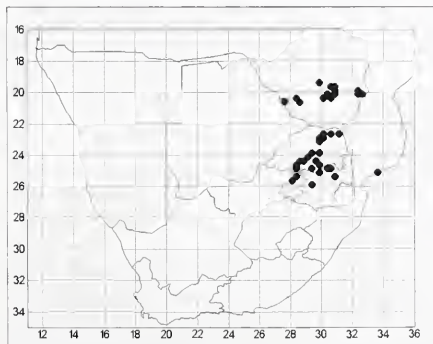
3. *A. aculeata* × *A. globuligemma* (no. 103). See *A. globuligemma*.

4. *A. aculeata* × *A. marlothii* subsp. *marlothii* (no. 104a). See *A. marlothii* subsp. *marlothii*.

5. *A. aculeata* × *A. excelsa* (no. 115). Voucher: *Bey* 52 (SRGH).

106. ***Aloe petricola*** *Pole Evans* in Transactions of the Royal Society of South Africa 5: 707 (1917); *Pole Evans*: t. 155 (1924e); *Reynolds*: 450 (1950); *Jeppe*: 4 (1969); *Bornman & D.S. Hardy*: 251 (1972); *B.-E. van Wyk & G.F. Sm.*: 152 (1996). Lectotype: Mpumalanga, near Nelspruit, *Pole Evans PRE196* (PRE!, here designated).

Plants stemless, 0.5–1.0 m tall excluding inflorescence, solitary. *Leaves* 20–30, 400–600 × 55–100 mm, shallowly channelled, glaucous to olive-green, upper surface sometimes with few scattered prickles, lower surface usually with prickles in median line, sometimes also scattered. *Inflorescence* of erect to suberect,



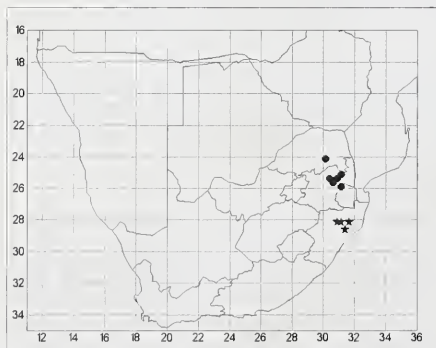
MAP 76.—*Aloe aculeata*

cylindric, very dense racemes, (0)2–3(–6)-branched, up to 1 m tall; bracts ovate-acute to deltoid-acuminate, 12–14 × 3–5 mm, 3–7-nerved. *Flowers* dull red to coral-red in bud, orange to ivory at flowering, 17–30 mm long, slightly ventricose, mouth upturned; outer segments connate in basal third, inner segments free; pedicels 2–4 mm long. *Anthers* exerted 5–12 mm. *Ovary* 3.5–5.0 × 2.0–3.0 mm; style exerted 5–12 mm. *Fruit* not seen. *Flowering time* July to August.

Aloe petricola always occurs on rocky outcrops in a small area of hilly granite and sandstone country in the Northern Province and Mpumalanga lowveld. Map 77.

Differences between this species and *A. aculeata* (no. 105) are dealt with under that species. *A. petricola* has a shorter inflorescence than *A. reitzii* (no. 107), and has shorter, ventricose flowers. The leaves of *A. petricola* are narrower and more spreading than those of *A. reitzii*. *A. gersneri* (no. 108) has more erect leaves, a longer inflorescence, longer pedicels and a different flowering season. In this species, flower colour varies considerably, not only from plant to plant, but within the same raceme, as the flowers age.

The specific epithet comes from a Greek



MAP 77.—● *Aloe petricola*
★ *A. gersneri*

word and suffix meaning 'tending (hence, inhabiting) rocks', and refers to the habitat of this species.

Vouchers: *Buitendag* 596 (PRE); *Kluge* 594 (PRE); *Reynolds* 5471 (BOL, PRE, SAM); *Rogers* 20248 (GRA); *Van der Schijff* 612 (PRE, SRGH).

Hybrid:

A. petricola × *A. greatheadii* var. *davyana* (no. 46b). See *A. greatheadii* var. *davyana*.

107. ***Aloe reitzii*** *Reynolds* in *Journal of South African Botany* 3: 135 (1937c); I. Verd.: t. 911 (1943); *Reynolds*: 452 (1950); *Jeppe*: 2 (1969); *Bornman & D.S. Hardy*: 253 (1972); B.-E. van Wyk & G.F.Sm.: 158 (1996). Type: Mpumalanga, near Dullstroom, *Reynolds* 2308 (PRE, holo.!; BOL!).

Plants usually solitary, stemless or with short procumbent stem, 600–900 mm tall excluding inflorescence. *Leaves* many, arcuate-erect, 400–650 × 85–120 mm, very shallowly channelled, glaucous to dull green, lower surface with few prickles in apical median line. *Inflorescence* of erect, very dense, cylindric-conical racemes, 2–6-branched, 1–1.3 m tall; bracts ovate-acute, 10–15 × 5–7 mm, many-nerved, reflexed. *Flowers* red above, lemon below, cylindric, arcuate-decurved, 32–50 mm long; mouth downturned; outer segments connate for 20–30 mm, inner segments free but dorsally adnate to outer in lower half; pedicels 2–3 mm long. *Anthers* exerted 2–10 mm. *Ovary* 5.0–9.0 × 1.5–4.0 mm, olive-green; style exerted 8–12 mm. *Fruit* ± 25 × 14 mm.

Both varieties of *A. reitzii* grow in rocky mountain grassland with severe winters and summer rain.

The long, recurved cylindric flowers of *A. reitzii* distinguish it from other species of this section. Differences between this species and *A. petricola* (no. 106) are discussed under that species. The inflorescence of *A. reitzii* tends to

be more freely branched than that of *A. gerstneri* (no. 108), and the pedicels are shorter. *A. reitzii* shares with *A. aculeata* (no. 105) the character of flower colour being different on the upper and lower parts of the same flower. In *A. reitzii* the flowers are red above and yellow below.

This species is named after Mr F.W. Reitz, who discovered it and drew Reynolds's attention to it.

Two varieties are recognised:

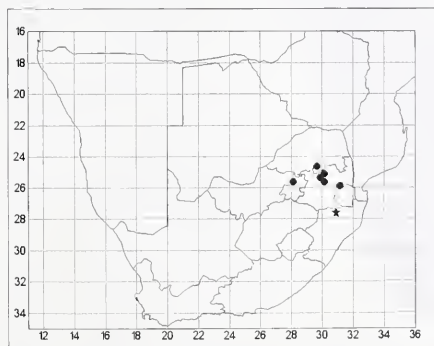
- Bracts ovate-acute, 10–15 mm long; capsule \pm 25 mm long 107a. var. *reitzii*
 Bracts deltoid-acuminate, up to 6 mm long; capsule \pm 15 mm long
 107b. var. *vernalis*

107a. var. ***reitzii***.

Description as for species. *Flowering time* February to March.

Found in the Northern Province, Gauteng, Mpumalanga and Swaziland. Map 78.

Vouchers: *Codd 6471* (PRE); *Henderson 1447* (NBG); *Reynolds 2315* (= *NBG63/41*) (NBG, PRE).



MAP 78.—● *Aloe reitzii* var. *reitzii*
 ★ *A. reitzii* var. *vernalis*

107b. var. ***vernalis*** *D.S.Hardy*, in *D.S.Hardy & Reid in Bothalia* 13: 451 (1981). Type: KwaZulu-Natal, Vryheid District, *Hardy 3589* (PRE!, holo.).

Leaves narrow, 400–640 \times 50–90 mm. *Inflorescence* of cylindric racemes, 700–750 mm tall; bracts deltoid-acuminate, \pm 6 \times 4–5 mm. *Flowers* 32–40 mm long. *Fruit* \pm 15 \times 10 mm. Other characters as in var. *reitzii*. *Flowering time* August to September.

Endemic to KwaZulu-Natal. Map 78.

The leaves are narrower than in the typical variety, the bracts are deltoid-acuminate, not lanceolate-acute, and the fruits are much smaller than in the typical variety.

The varietal epithet refers to the flowering season; the Latin word *vernalis* means 'pertaining to springtime'.

Voucher: *Hardy 3589* (PRE).

108. ***Aloe gerstneri*** *Reynolds* in *Journal of South African Botany* 3: 133 (1937c); *Reynolds*: 454 (1950); *Jeppe*: 3 (1969); *Bornman & D.S.Hardy*: 255 (1972); *Glen & D.S.Hardy*: t. 2008 (1990b); *B.-E. van Wyk & G.F.Sm.*: 134 (1996). Type: KwaZulu-Natal, Nondweni Bridge, *Reynolds 2320* (PRE, holo.!: BOL!).

Plants stemless to short-stemmed, 400–700 mm tall excluding inflorescence, solitary. *Leaves* 20–30, arcuate-erect to arcuate-incurved, lanceolate-ensiform, 400–600 \times 60–90 mm, slightly channelled to D-shaped in section, glaucous to dull green, lower surface sometimes with apical median line of few prickles. *Inflorescence* of very dense, cylindric racemes, 1–3-branched, 1.0–1.3 m tall; bracts narrowly lanceolate, 18–20 \times 5–6 mm, \pm 5-nerved. *Flowers* orange in bud, chrome-yellow at flowering, 24–30 mm long, cylindric-ventricose, mouth slightly narrowed and upturned; outer segments free for \pm half their length, inner segments free but dorsally adnate to outer seg-



FIGURE 22.—Section *Pachythamnos*. *Aloe gerstneri*: 1, upper portion (except apex) of inflorescence, $\times 0.8$; 2, upper portion of leaf, $\times 0.8$; 3, half-flower, $\times 0.8$; 4, habit, much reduced. Taken from Glen & Hardy (1990b).

ments in lower third; pedicels 5–6 mm long. *Anthems* exerted up to 13 mm. *Ovary* $\pm 5 \times 3$ mm, pale green; style exerted 4–14 mm. *Fruit* not seen. *Flowering time* February to March. Figure 22.

Aloe gerstneri occurs in rocky grassland in KwaZulu-Natal, in an area of cold winters and reasonably high rainfall. Map 77.

Differences between this species on the one hand and *A. petricola* (no. 106) and *A. reitzii* (no. 107) on the other are discussed under those species. *A. aculeata* (no. 105) differs from this species in geographical range and flowering time and in having larger flowers and copious prickles on the leaves.

Born in Augsburg, Germany in 1888, Father Jacob Gerstner (after whom this species is named) arrived in South Africa in 1924 as a Roman Catholic missionary with an interest in

botany. He was Superior of Mission Farms in Zululand from 1928 to 1942 and collected many plant specimens and much information concerning African names and uses of plants. He died in 1948, while collecting material of *Strophanthus* in Zambia for chemical study. At the time of his death he was also engaged in writing a *Flora* of Zululand; unfortunately it does not appear that this project was completed. Any manuscript of this work seems to have vanished without trace. Father Gerstner first collected this species in Zululand in 1931, when he sent living plants to Kirstenbosch. It seems that N.S. Pillans recognised these plants as a new species, but although he intended to describe this new species under the name by which we now know it, he did not do so. Gerstner records the Zulu common name *isihlabane* for this species.

Vouchers: *Gerstner* 557 (BOL); *Gibson s.n.* (NU); *Reynolds* 5745 (PRE).

23. Section **Pachydendron**

Section **Pachydendron** (Haw.) *Salm-Dyck*, Monographia generum Aloes et Mesembryanthemi: 27 (1842); Baker: 304 (1896a); A.Berger: 305 (1908); Reynolds: 442 (1950). Type species: *A. ferox* Mill.

Pachydendron Haw.: 35 (1821) pro genus.

Plants arborescent; stems usually simple, rarely branched, not suckering. *Leaves* rosulate, deltoid to lanceolate or ensiform, arcuate-incurved to reflexed, green to glaucous, unspotted, margins dentate, surfaces sometimes with prickles. *Inflorescence* a panicle with usually few branches; peduncles with sterile bracts; racemes dense, erect, cylindric to narrowly conical; pedicels short. *Flower* cylindric to clavate, straight or variously curved; outer segments connate in lower half, inner segments free or adnate to outer. *Anthems* usually long-exserted. *Style* usually long-exserted.

1a Leaves with surface prickles:

2a Perianth mouth straight:

3a Bracts ovate; plants occurring from KwaZulu-Natal to Western Cape 110. *A. ferox*

3b Bracts deltoid; plants occurring in Botswana, Northern Province and tropical Africa
. 115. *A. excelsa*

2b Perianth mouth upturned:

4a Plant occurring in Western and Eastern Cape; leaves up to 650 mm long; perianth
cylindric 109. *A. africana*

4b Plant occurring in KwaZulu-Natal; leaves at least 1 m long; perianth ventricose . . .
. 113. *A. thuraskii*

1b Leaves without surface prickles:

5a Bracts shorter than or as long as pedicels:

6a Plants 6–8 m tall; bracts as long as pedicels, these up to 2 mm long; perianth mouth straight 112. *A. rupestris*6b Plants 3–4 m tall; bracts shorter than pedicels, these over 10 mm long; perianth mouth upturned 111. *A. angelica*.

5b Bracts longer than pedicels:

7a Racemes relatively lax; bracts lanceolate; perianth cylindric-trigonous; pedicels over 6 mm long 114. *A. littoralis*7b Racemes very dense; bracts deltoid; perianth ventricose; pedicels up to 5 mm long 115. *A. excelsa*

This section comprises tall, single-stemmed aloes with symmetrical racemes. In most cases the racemes are cylindric with subsessile to shortly pedicellate flowers subtended by small, inconspicuous bracts. Extra-tropical southern African representatives of this section retain the old, dry leaves, but some tropical species shed them. In southern Africa, this section typically occurs in parts of the summer-rainfall area with moderate to low rainfall.

109. *Aloe africana* Mill., The gardener's dictionary: no. 4 (1768); W.T.Aiton: 296 (1811); Haw.: 76 (1812); Haw.: 46 (1819); Salm-Dyck: 27, t. 2 (1863); Baker: 327 (1896a); A.Berger: 306 (1908); Pole Evans: t. 333 (1929b); Reynolds: 456 (1950); Jeppe: 41 (1969); Borman & D.S.Hardy: 257 (1972); Palmer & Pitman: 381 (1972); B.-E. van Wyk & G.F.Sm.: 42 (1996). Neotype: Western Cape, Mossel Bay, *Pole Evans* 225 (PRE, holo.!; BM!), here designated.

A. perfoliata L. var. β L.: 320 (1753). Iconotype: C.Commelijn, *Praeludia botanica*: 69, t. 18 (1703).

A. perfoliata L. β *africana* (Mill.) Aiton: 466 (1789). *Pachidendron africanum* (Mill.) Haw.: 38 (1821).

A. africana Mill. var. *latifolia* Haw.: 47 (1819). Type: not cited.

A. africana Mill. var. *angustior* Haw.: 47 (1819); Sims: t. 2517 (1824). Lecto-iconotype: Curtis's Botanical Magazine 51: t. 2517 (1824).

A. angustifolia Haw.: 47 (1819). *P. angustifolium* (Haw.) Haw.: 38 (1821). Type: not cited.

P. africanum (Mill.) Haw. var. *latum* Haw.: 36 (1821). Based on *A. africana* Mill. var. *latifolia* Haw.

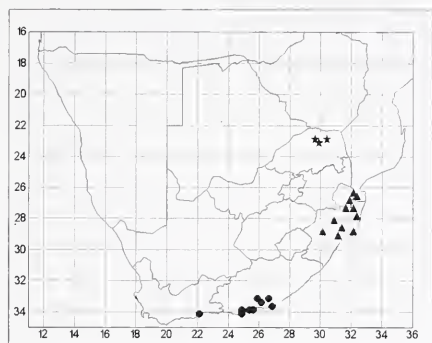
P. africanum (Mill.) Haw. var. *angustum* Haw.: 37 (1821). Based on *A. africana* Mill. var. *angustior* Haw.

A. bolusii Baker: 179 (1880a). Type: Eastern Cape, no precise locality, *Bolus s.n.* (K!).

Plants tree-like, 2–4 m tall, stems usually simple, rarely branched near base. *Leaves* \pm 30, spreading to recurved, 300–650 \times 35–120 mm, shallowly channelled, green to glaucous green, upper surface with or without few scattered prickles, lower surface with prickles in apical median line, sometimes also scattered. *Inflorescence* of very dense, cylindric-conical racemes, 2–4-branched, 600–800 mm tall; bracts ovate-acute, 8–13 \times 5–10 mm, obscurely many-nerved. *Flowers* yellow to orange, 28–55 mm long, cylindric, mouth upturned; outer segments connate in lower two thirds, inner segments free but cohering to outer in lower two thirds; pedicels 2–6 mm long. *Anthers* exserted 8–15 mm. *Ovary* 6.0–9.0 \times 2.0–4.5 mm, pale lemon; style exserted 9–20 mm. *Fruit* 20–22 \times 12–14 mm, yellow-brown. *Flowering time* June to July.

Aloe africana occurs on sandy soil in coastal and valley bushveld in the Western and Eastern Cape. The area is frost-free and receives rain throughout the year, with a summer maximum. Map 79.

When flowering, *A. africana* is immediately distinguished from *A. ferox* (no. 110) by the flower tube, which is so sharply upcurved that the exserted portion of the style stands at right angles to the ovary. In *A. ferox* the flower is



MAP 79.—● *Aloe africana*
★ *A. angelica*
▲ *A. rupestris*

straight. The leaves of *A. africana* are thinner, narrower and more openly spreading to recurved, and the prickles on the undersurface are in a median line, whereas in *A. ferox* the prickles on the undersurface are randomly scattered.

The specific epithet is the first adjective in the pre-Linnaean phrase name *Aloe africana caulescens, foliis minus glaucis caulem amplexantibus, dorsi parte superiore spinosa* (Commelin 1703). It signifies that the plant is an *Aloe*, not an *Agave*; in the early eighteenth century these two genera were not distinguished from each other, and the few species of *Agave* known then had phrase names starting *Aloe americana* Palmer & Pitman (1972) record the common names Uitenhage aloe and *Uitenhaagse aalwyn* (Afrikaans) for this species.

Vouchers: *Bayliss 1278* (PRE); *Dahlstrand 1915* (PRE, STE); *Fourcade 4011* (BOL, PRE, STE); *Reynolds 2617* (PRE); *Thompson 917* (STE).

Hybrids:

1. *A. africana* × *A. striata* subsp. *striata* (no. 61a). See *A. striata* subsp. *striata*.

2. *A. africana* × *A. microstigma* subsp. *microstigma* (no. 92a). See *A. microstigma* subsp. *microstigma*.

3. *A. africana* × *A. speciosa* (no. 98). See *A. speciosa*.

4. *A. africana* × *A. ferox* (no. 110). Voucher: *Reynolds 876* (BOL).

110. *Aloe ferox* Mill., The gardener's dictionary: no. 22 (1768); Lam.: 87 (1783); DC.: t. 32 (1800); W.T.Aiton: 293 (1811); Haw.: 76 (1812); Sims: t. 1975 (1818); Salm-Dyck: 27, t. 5 (1842); Baker: 326 (1896a); Pole Evans: t. 169 (1925e); Reynolds: 123 (1937e); Reynolds: 460 (1950); Jeppe: 40 (1969); Bornman & D.S.Hardy: 259 (1972); Palmer & Pitman: 383 (1972); B.-E. van Wyk & G.F.Sm.: 52 (1996). Neotype: Eastern Cape, Kobonqaba Hills, *Pegler 1201* (PRE, holo.!; BM!, BOL!, GRA!, K!, STE!), here designated.

A. perfoliata L. var. ϵ L.: 320 (1753). Iconotype: C.Commelijn, *Praeludia botanica*: 71, t. 20 (1703).

A. perfoliata L. var. γ L.: 320 (1753); Willd.: 185 (1799). Iconotype: C.Commelijn, *Praeludia botanica*: 70, t. 19 (1703).

A. perfoliata L. var. θ (Mill.) Aiton: 467 (1789). Type: not cited.

A. perfoliata Thunb.: 6 (1785); Thunb.: 61 (1794); Thunb.: 182 (1800); Thunb.: 310 (1823). Type: Cape, no precise locality, *Thunberg 8593* (UPS, holo.!; PRE, photo.).

A. perfoliata L. var. ζ Willd.: 186 (1799). Type: not cited.

A. supralaevis Haw.: 22 (1804); Haw.: 77 (1812); Salm-Dyck: 27, t. 6 (1863); Baker: 327 (1896a); A.Berger: 308 (1908). *Pachidendron supralaeve* (Haw.) Haw.: 38 (1821). Lecto-iconotype: C.Commelijn, *Praeludia botanica*: 71, t. 20 (1703).

A. pseudo-ferox Salm-Dyck: 31 (1817). *P. pseudo-ferox* (Salm-Dyck) Haw.: 38 (1821). Type: not cited.

P. ferox (Mill.) Haw.: 38 (1821).

A. subferox Spreng.: 73 (1825). Type: not cited.

A. ferox Mill. var. *incurva* Baker: 180 (1880a); Baker: 327 (1896a). Type: Hort., *Cooper s.n.* (K, holo.!; PRE, photo.).

A. galpinii Baker: 135 (1901b). *A. ferox* Mill. var. *galpinii* (Baker) Reynolds: 127 (1937e). Type: Eastern Cape, Queenstown, *Galpin 2335* (K, holo.; BOL!, PRE!, PRE, photo.).

A. candelabrum A.Berger: 246 (1906b); A.Berger: 306 (1908); R.A.Dyer: t. 945 (1944); Reynolds: 468 (1950); Jeppe: 39 (1969); Bornman & D.S.Hardy: 261 (1972);

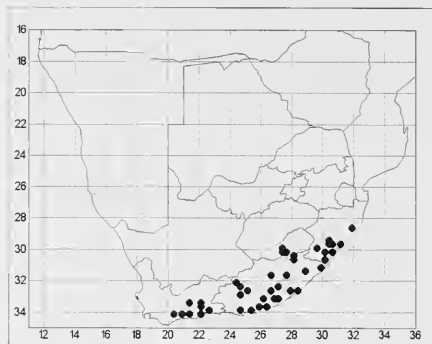
Palmer & Pitman: 384 (1972). Type: KwaZulu-Natal, no precise locality, *Medley Wood 4345* (B, holo.; NH!).

A. supralaevis Haw. var. *erythrocarpa* A.Berger: 309 (1908). Type: Hort. La Mortola, Anon. s.n. (B).

Trees; stems simple, 2–4(–5) m tall. *Leaves* 50–60, arcuate-erect to spreading, 500–1000 × 65–150 mm, shallowly channelled, dull green to glaucous, sometimes reddish tinged, both surfaces with or without prickles. *Inflorescence* of cylindric or narrowly conical, very dense racemes, 5–12-branched, ± 1 m tall; bracts ovate-acute, 7–11 × 3–6 mm, 3–many-nerved. *Flowers* scarlet to orange, very rarely yellow or white, 23–35 mm long; subclavate to ventricose; outer segments connate in lower third, inner segments free but dorsally adnate to outer in lower third; pedicels 3–8 mm long. *Antthers* exserted 9–25 mm. *Ovary* 5–7 × 2–4 mm, green; style exserted 12–25 mm. *Fruit* 20–23 × 10–12 mm, yellowish grey-brown. *Seeds* almost black, ± 5.0 × 3.0 × 0.6 mm, broadly winged. *Flowering time* (May to) June to August (to November), depending on locality and minimum winter temperatures.

Aloe ferox is found in KwaZulu-Natal, Lesotho, the Eastern and Western Cape. It grows in vast numbers on rocky hillsides in grassland on the margins of the karoo. It also occurs in grassy fynbos (e.g. in the Bontebok National Park near Swellendam), in the Little Karoo and in grassland in Lesotho, southern KwaZulu-Natal and the Eastern Cape. Winters may be very severe to mild, and this species tolerates winter, summer and all-seasons rainfall. Map 80.

Differences between this species on the one hand and *A. pluridens* (no. 97) and *A. africana* (no. 109) on the other are discussed under those species. The leaves of *A. ferox* are more spreading than those of *A. marlothii* (no. 104). The erect, symmetrical racemes of red to orange (rarely white) flowers in *A. ferox* differ from the usually subhorizontal, second racemes of orange to yellow flowers in *A. marlothii*. The bracts of *A. ferox* are about twice as long as those of *A. marlothii*. Adult plants of *A. ferox*



MAP 80.—*Aloe ferox*

are relatively light and can be carried by one strong man. Adult plants of *A. marlothii*, on the other hand, are much heavier at the same size, and require several strong men to lift one.

The specific epithet (Latin *ferox* = war-like) refers to the prickly leaf surfaces, which were mentioned in the pre-Linnaean phrase-names (e.g. Commelijn 1703). Several common names are recorded for this species, including bitter aloe, red aloe, *bitteraalwyn*, *tapaalwyn* (both Afrikaans), *unhlaba* (Zulu), *ikhala* (Xhosa) and *hlaba* and *lekhala la Quthing* (aloe of Quthing [Moyeni], seSotho) (Reynolds 1950; Palmer & Pitman 1972). This species is the classic source of the drug Cape aloes and Reynolds (1950) describes the extraction of this substance at some length. The fleshy part of the leaves is used in the northern parts of the Eastern Cape to make jam, and the juice has also been used in the manufacture of cosmetics. Tribal uses of the plant include living fences for stock kraals and the use of leaf ash as an adulterant for snuff. It is reported that the leaf smoke acts as an insect repellent and that the leaf juice features in a tribal cure for venereal disease. Watt & Breyer-Brandwijk (1963) record a superstition that over-indulgence in the nectar produces persistent weakness in the joints. This is one of the few plant species that is recognisable in a Bushman rock-painting, which is reproduced by Reynolds (1950).

Vouchers: *Dieterlen 943* (PRE, SAM); *Galpin 2335* (BOL, PRE); *Moll 3283* (NU, PRE); *Reynolds 2049* (PRE); *Strey 8704* (NH, PRE, SRGH).

Hybrids:

1. *A. ferox* × *A. broomii* var. *broomii* (no. 26a). See *A. broomii* var. *broomii*.

2. *A. ferox* × *A. maculata* (no. 45). See *A. maculata*.

3. *A. ferox* × *A. striata* subsp. *striata* (no. 61a). See *A. striata* subsp. *striata*.

4. *A. ferox* × *A. arborescens* (no. 96) (= *A. × salmdyckiana* Schult.f.). See *A. arborescens*.

5. *A. ferox* × *A. pluridens* (no. 97). See *A. pluridens*.

6. *A. ferox* × *A. speciosa* (no. 98) (= *A. × tomlinsonii* Marloth). See *A. speciosa*.

7. *A. ferox* × *A. marlothii* subsp. *marlothii* (no. 104a). See *A. marlothii* subsp. *marlothii*.

8. *A. ferox* × *A. africana* (no. 109). See *A. africana*.

111. ***Aloe angelica*** *Pole Evans* in *The Flowering Plants of South Africa* 14: t. 554 (1934b); Reynolds: 470 (1950); Jeppe: 36 (1969); Bornman & D.S.Hardy: 263 (1972); Palmer & Pitman: 385 (1972); B.-E. van Wyk & G.F.Sm.: 46 (1996). Type: Northern Province, Wylles Poort, *Pole Evans PRE13040* (PRE!).

Trees; stems simple or branched, 3–4 m tall. *Leaves* many, spreading to recurved, 500–800 × 70–120 mm, shallowly channelled, green, without surface prickles. *Inflorescence* repeatedly branched, with up to 20 racemes; these short, cylindric, subcapitate, very dense; bracts ovate-acute to deltoid-acute, 8–10 × 3–10 mm, 3–5-nerved. *Flowers* orange-red to red in bud, yellow to greenish yellow at flowering, subventricose, 24–26 mm long, mouth upturned; outer segments connate in basal third, inner segments free; pedicels 11–25 mm long, lengthening to ±

45 mm in fruit. *Anthers* exerted 7–15 mm. *Ovary* ± 7 × 2 mm; style exerted 6–15 mm. *Fruit* 32–35 × 9–11 mm, buff-grey. *Flowering time* May to June. Figure 23.

Aloe angelica is restricted to rocky slopes in the Soutpansberg and the Blouberg in the Northern Province. Rainfall is low in its distribution range, and the winters are mild to warm. As this species occurs in the mist belt, it is to be expected that much of the moisture it receives is precipitated as condensation from mist. Map 79.

The capitate, bicoloured racemes of this species are unique in the section. With its tall stem and strongly recurved leaves, *A. angelica* may recall *A. alooides* (no. 101) when not in flower, but the inflorescences of these two species differ in every detail.

This species is named after Mrs R.C. Wallace (Angelique), whose husband was sometime Chief Engineer of the South African Railways. Col. Wallace brought the species to the attention of Dr Pole Evans, who described it.

Vouchers: *Hall 920* (NBG); *Hutchinson & Gillett 3233* (K); *Pole Evans 303* (BM, PRE, SAM); *Prosser 1925* (PRE); *Van der Schijff 3823* (BOL, PRE, SRGH).

Hybrid:

A. angelica × *A. marlothii* subsp. *marlothii* (no. 104a). See *A. marlothii* subsp. *marlothii*.

112. ***Aloe rupestris*** *Baker* in *T.-Dyer, Flora capensis* 6: 327 (1896); A.Berger: 313 (1908); Pole Evans: t. 178 (1925f); Reynolds: 473 (1950); Jeppe: 44 (1969); Bornman & D.S.Hardy: 265 (1972); Palmer & Pitman: 387 (1972); Compton: 101 (1976); B.-E. van Wyk & G.F.Sm.: 64 (1996). Type: Hort. Cape Town, *MacOwan 1556* (= *SAM22686*) (K, holo.!; SAM!; PRE, photo.).

A. nitens Baker: 170 (1880a); Baker: 325 (1896a); C.H.Wright: t. 8147 (1907); A.Berger: 313 (1908); Pole Evans: t. 221 (1926b) non Schult. & Schult.f.. Type: Eastern Cape (?), no precise locality, *Barkly s.n.* (K!).



1/2 L. J. J. J.

FIGURE 23.—Section *Pachydendron*. *Aloe angelica*: 1, habit, much reduced; 2, bract; 3, longitudinal section of flower; 4, inflorescence; 5, flower, seen from above, $\times 0.8$; 6, flower and pedicel, lateral view, $\times 0.8$. Taken from Pole Evans (1934b).

Trees; stems 6–8 m tall, usually simple. *Leaves* 30–40, erect to recurved, 300–750 × 35–100 mm, channelled, deep green, without surface prickles. *Inflorescence* with 12–18 racemes, 1.0–1.3 m tall; racemes very dense, cylindric; bracts oblong, 1–2 × 2–3 mm. *Flowers* orange-yellow in bud, lemon at flowering, 15–20 mm long, cylindric-ventricose; outer segments connate in lower half, inner segments free but dorsally adnate to outer for ± 5–6 mm; pedicels 1–2 mm long. *Anthers* exerted 7–15 mm; filaments vermilion. *Ovary* 4–5 × 2–3 mm, green; style deep orange, exerted 7–20 mm. *Fruit* not seen. *Flowering time* August to September.

Aloe rupestris occurs in Swaziland, KwaZulu-Natal and Mozambique in Zululand thornveld, sometimes in dense bush, usually on rocky outcrops. It grows in areas with warm, completely frost-free winters. There is a sight record of this species from southern Mozambique, quoted by Reynolds (1950: 475). Map 79.

This species is close to *A. thraskii* (no. 113) and *A. excelsa* (no. 115). The stem of *A. rupestris* sometimes branches, unlike *A. excelsa*, and the leaves are smaller and lack the surface prickles which are common in *A. excelsa*. The racemes of *A. rupestris* are erect, while those of *A. excelsa* are more or less oblique. In *A. thraskii*, the leaves are much longer than those of *A. rupestris*, and are deeply channelled and reflexed. The racemes of *A. thraskii* are much broader than those of *A. rupestris*, the flowers are longer and brown, not orange-yellow becoming lemon-yellow, and the exerted portions of the stamens and styles of *A. thraskii* emerge from the flower at an angle, not straight as in *A. rupestris*.

Palmer & Pitman's (1972) statement that this species occurs in Zimbabwe is probably due to a misidentification of *A. excelsa*. *A. rupestris* is, however, among the most widely cultivated species of *Aloe*. The specific epithet means 'associated with rocks or cliffs'. Common names recorded for this species include *inkalane*, *umhlabanhlazi* and *uphondonde* (Zulu), and *inhlaba* (siSwati) (Palmer & Pitman 1972).

Vouchers: *Henderson 1764* (NBG); *Medley Wood 4410* (K); *Moll 3295* (NU, PRE); *Reynolds 5498* (BOL, NH, PRE); *Ward 4221* (PRE).

Hybrid:

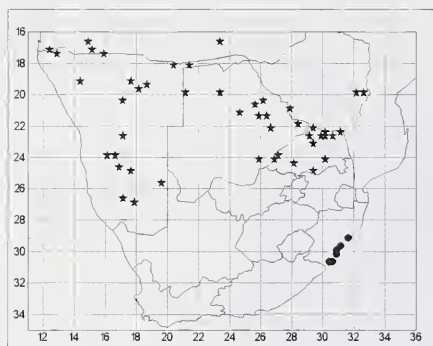
A. rupestris × *A. marlothii* subsp. *marlothii* (no. 104a). See *A. marlothii* subsp. *marlothii*.

113. *Aloe thraskii* Baker in Journal of the Linnean Society of London, Botany 18: 180 (1880a); Baker: 328 (1896a); A. Berger: 315 (1908); Sim: 153 (1919); Van der Merwe: t. 923 (1944); Reynolds: 475 (1950); Jeppe: 42 (1969); Bormman & D.S. Hardy: 267 (1972); Palmer & Pitman: 389 (1972); B.-E. van Wyk & G.F. Sm.: 68 (1996). Type: South Africa, no precise locality, *Cooper s.n.* (K, holo.!; PRE, photo.!).

Trees; stems simple, 1–2(–4) m tall. *Leaves* many, 1.0–1.6 × 0.13–0.22 m, deeply channelled, olive-green, upper surface without prickles, lower surface with few prickles in median line. *Inflorescence* with 4–8 racemes, 500–800 mm tall; racemes cylindric-conical, very dense; bracts ovate-acute, 7–9 × 4–6 mm, 5–7-nerved. *Flowers* greenish to orange in bud, lemon-yellow to pale orange at flowering, 18–29 mm long, ventricose; outer segments connate in basal third, inner segments free but adnate to outer in basal quarter; pedicels 1–2 mm long. *Anthers* exerted 4–20 mm. *Ovary* 5.0–6.0 × 2.0–3.5 mm, lemon to pale green; style exerted 4–20 mm. *Fruit* ± 30 × 16 mm, reddish brown. *Flowering time* June to July.

Endemic to KwaZulu-Natal. This is one of the very few species of *Aloe* not occurring away from the sea. In nature it grows only on beach dunes, and in cultivation it will not flourish away from the coast. Map 81.

The recurved, deeply channelled leaves of this species recall those of *A. alooides* (no. 101), but they are somewhat larger and less strongly recurved in this species. The inflorescence of *A. thraskii* differs from that of *A. alooides* in every detail. Differences between



MAP 81.—● *Aloe thraskii*
★ *A. littoralis*

this species and *A. rupestris* (no. 112) are dealt with under that species. Palmer & Pitman (1972) report that it is not known after whom this species is named. Common names recorded include dune aloe, *strandaalwyn* (Afrikaans) and *umhlaba* (Zulu).

Vouchers: *Leach 102* (SRGH); *Marloth 5129* (BOL, PRE); *Medley Wood 11688* (NH, SAM); *Reynolds 2023* (PRE, SAM); *Van der Merwe 2655* (BM, PRE).

114. *Aloe littoralis* Baker in Transactions of the Linnean Society of London 1: 263 (1878b); Baker: 467 (1898a); A.Berger: 223 (1908); Reynolds: 81 (1960); Reynolds: 317 (1966); Jeppe: 46 (1969); Sölch, Roessler & Merxm.: 17 (1970); Bornman & D.S.Hardy: 175 (1972); Palmer & Pitman: 371 (1972); West: 84 (1974); Jankowitz: 8 (1975); B.-E. van Wyk & G.F.Sm.: 56 (1996). Type: Angola, near Luanda, *Welwitsch 3727* (BM, holo.!; K!, LISU; PRE, photo.!).

A. rubrolutea Schinz: 39 (1896); Baker: 460 (1898a); A.Berger: 221 (1908); A.Berger (1909); Van der Merwe: t. 802 (1941); Reynolds: 327 (1950). Syntypes: Namibia, Rehoboth, *Fleck 497a* (Z); Namibia, !Kuisib, *Fleck 472* (Z); Botswana, Olifantskloof, *Fleck 263* (Z).

A. schinzii Baker: 459 (1898a). Type: Botswana, Olifantskloof, *Schinz 42* (K).

Trees; stems solitary, 2–4 m tall. *Leaves* 30–40, arcuate-erect to slightly reflexed, 300–650 × 65–130 mm, shallowly channelled, greyish green to yellowish green, sometimes tinged reddish, usually unspotted, rarely with white spots, without prickles. *Inflorescence* of conical, subracemes; many-branched, 1.0–1.5 m tall; bracts lanceolate-acuminate, 9–18 × 4–8 mm, 5–many-nerved. *Flowers* red or pink, rarely yellow, 23–34 mm long, cylindric-trigynous; outer segments connate in lower half, inner segments free but adnate to outer in lower half; pedicels 6–12 mm long. *Anthers* exserted 1–5 mm. *Ovary* 5.0–8.0 × 2.5–4.0 mm, olive-green; style exserted 2–10 mm. *Fruit* 18–28 × 10–15 mm, grey. *Seeds* ± 9.0 × 4.0 × 1.5 mm, charcoal-grey, with broad, pale grey, dark-spotted wing. *Flowering time* July to February, varying according to locality.

This species is found in Namibia, Botswana and the Northern Province; also in Angola, Zambia and Zimbabwe. It usually grows on rocky outcrops in mixed open woodland and grassland. It may also occur on calcrete or sand. Its preferred habitat is characterised by summer rain and very dry, warm to cool winters. Map 81.

Aloe littoralis is easily distinguished from all other tall-stemmed aloes in the western part of our region (and, in fact, most members of section *Pachydendron*) by its much-branched inflorescence with numerous laxly flowered erect racemes. This character suite can be used in the field at almost any time of the year, as it can be seen on dead inflorescences which persist for many months before disintegrating. The flowers of this species vary in colour from crimson to dirty yellow.

The specific epithet (Latin *littoralis* = pertaining to the sea-shore) indicates that this species was first known from the coast near Luanda, Angola. Common names recorded for this species include *otjindombo* (otjiHerero) and *goresib* (Nama) (Reynolds 1950). This is the species figured on the Windhoek coat of arms.

Vouchers: *Codd* 8672 (PRE); *Giess* 13333 (PRE); *Leach & Bayliss* 12974 (PRE); *Reynolds* 5732 (PRE); *Van der Schijff* 3083 (PRE).

Hybrids:

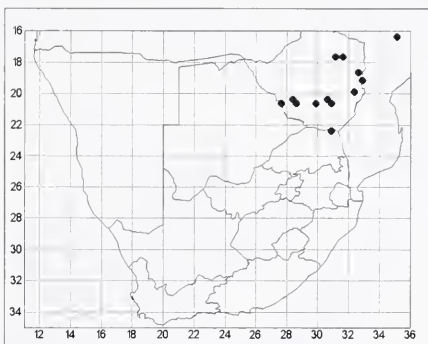
1. *A. littoralis* × *A. greatheadii* var. *greatheadii* (no. 46a). See *A. greatheadii* var. *greatheadii*.

2. *A. littoralis* × *A. zebrina* (no. 56). This is the apparent ancestry of *A. angolensis* (no. 57).

115. **Aloe excelsa** *A. Berger* in Notizblatt des Botanischen Gartens und Museums zu Berlin 4: 247 (1906b); *A. Berger*: 314 (1908); *Pole Evans*: t. 62 (1922c); *Reynolds*: 314 (1966); *Jeppé*: 45 (1969); *Bornman & D.S. Hardy*: 273 (1972); *West*: 81 (1974); *B.-E. van Wyk & G.F.Sm.*: 50 (1996). Type: Zimbabwe, Bulawayo, *F. Eyles* 1240 in *Herb. Marloth* 3888 (PRE, holo.!; BOL!).

Trees; stems simple, 2–4 m tall. *Leaves* ± 30, 500–900 × 60–150 mm, channelled, olive-green, tinged reddish, lower surface usually with few scattered prickles. *Inflorescence* with ± 6–12 racemes, 0.8–1.0 m tall; racemes erect to suboblique, cylindric-conical, very dense; bracts deltoid-acute, 4–6 × 3–6 mm, 3–5-nerved. *Flowers* scarlet to reddish orange, 25–35 mm long, cylindric-ventricose; outer segments connate in basal quarter, inner segments free; pedicels 1–5 mm long. *Anthers* exserted 7–15 mm. *Ovary* ± 6 × 2 mm; style exserted 10–15 mm. *Fruit* 17–20 × 11–12 mm, blue-grey. *Flowering time* July to September.

Aloe excelsa is found in Botswana and the Northern Province; also in Zambia and Zimbabwe. It occurs on rocky outcrops and hill-sides, very often in shade in thick bush in mopane or msasa woodland. Its area of distribu-



MAP 82.—*Aloe excelsa*

tion is characterised by hot summers with moderate to low rainfall and warm, dry winters. Map 82.

Differences between this species and *A. rupestris* (no. 112) are discussed under that species. *A. excelsa* differs from *A. thraskii* (no. 113) in habitat (not occurring in nature anywhere near the sea), in having spreading to erect, not recurved leaves with surface prickles, and in having oblique racemes of brilliant red, orange or yellow (rarely white) but not brown flowers.

The specific epithet means 'high' or 'eminent', referring to the tall stems.

Vouchers: *Hardy* 5680 (PRE); *W. Jacobsen* 3458 (PRE); *Plowes* 2905 (PRE); *P.A. Smith* 2462 (SRGH); *Williamson* 1087 (PRE).

Hybrids:

1. *A. excelsa* × *A. chabaudii* var. *chabaudii* (no. 80a). See *A. chabaudii* var. *chabaudii*.

2. *A. excelsa* × *A. aculeata* (no. 105). See *A. aculeata*.

24. Section **Dracoaloe**

Section **Dracoaloe** *A. Berger* in Botanische Jahrbücher 36: 48 (1905a); *A. Berger*: 317 (1908); *Reynolds*: 486 (1950). Type species: *A. dichotoma* Masson.

Plants shrubby to arborescent, much branched, not suckering. *Leaves* rosulate, narrowly lorate-lanceolate or ensiform, erectly spreading to reflexed, glaucous, unspotted, margins minutely den-



FIGURE 24.—Section *Dracoaloe*. *Aloe dichotoma*: 1, habit, much reduced; 2, cross section of leaf; 3, median longitudinal section of flower; 4, raceme, $\times 1$; 5, upper part of leaf, $\times 0.8$; 6, base of inflorescence, $\times 0.4$. Taken from Pole Evans (1938d).

tate, surfaces sometimes with soft prickles in juvenile plants. *Inflorescence* a panicle with usually few branches; peduncles without sterile bracts; racemes cylindric, sublat. *Flowers* cylindric-ventricose, yellow, segments connate in lower half; pedicels short. *Anthers* long-exserted. *Style* long-exserted.

Inflorescence erect; plant a much-branched tree or large shrub 116. *A. dichotoma*
 Inflorescence pendent; plant a sparsely branched tree 117. *A. pillansii*

The species of this section are dichotomously branched trees or large shrubs with fleshy yellow flowers and very narrow olive-green leaves. They grow in arid parts of the Northern Cape and similar parts of Namibia.

116. **Aloe dichotoma** Masson in Philosophical Transactions of the Royal Society 66: 310 (1776); L.f.: 206 (1782); Lam.: 91 (1783); Thunb.: 6 (1785); Aiton: 466 (1789); Thunb.: 61 (1794); Willd.: 184 (1799); Thunb.: 182 (1800); W.T.Aiton: 296 (1811); Haw.: 72 (1812); Thunb.: 309 (1823); Baker: 325 (1896a); Baker: 468 (1898a); A.Berger: 317 (1908); H.Pearson: 44 (1914); Marloth: 91 (1915); Dinter: 85 (1917); Pole Evans: t. 709 (1938d); Reynolds: 488 (1950); Jeppe: 57 (1969); Sölch, Roessler & Merxm.: 16 (1970); Bornman & D.S.Hardy: 277 (1972); Palmer & Pitman: 392 (1972); Jankowitz: 38 (1975); B.-E. van Wyk & G.F.Sm.: 32 (1996). Type: Cape of Good Hope, *Thunberg* 8587 (UPS, holo.!; PRE, photo.).

A. ramosa Haw.: 26 (1804). Lecto-iconotype: Pluk., *Phytographia* 129.4 (1691).

Rhipidodendron dichotomum (Masson) Willd.: 166 (1811).

A. montana Schinz: 39 (1896); Baker: 458 (1898a). *A. dichotoma* Masson var. *montana* (Schinz) A.Berger: 319 (1908). Type: Namibia, Gamsberg, *Fleck* 461 (Z).

Trees 3–9 m tall, with many dichotomous branches. *Leaves* 10–20 per rosette, lorately-lanceolate, 200–350 × 20–50 mm, slightly biconvex to shallowly channelled, glaucous green. *Inflorescence* robust, erect, 3–5-branched, 150–300 mm tall; bracts deltoid-cirrhous, 4.0–8.0 × 0.5–3.0 mm, 1–3-nerved. *Flowers* lemon-yellow to canary-yellow, 27–40 mm long, cylindric-ventricose; outer segments connate in basal third, inner segments free; pedicels 5–10 mm long. *Anthers* exserted 1–20

mm. *Ovary* 6–9 × 3–5 mm, pale brown; style exserted 9–15 mm. *Fruit* 30–45 × 15–20 mm, yellow-ochre. *Seeds* ochre-grey, ± 16.5 × 9.0 × 3.0 mm including a broad wing. *Flowering time* June to July. Figure 24.

Aloe dichotoma occurs on arid, rocky hill-sides in Namaqualand broken veld, succulent karoo and various karroid grassland veld types. Rainfall is minimal, with winter or summer maxima.

Two varieties are recognised:

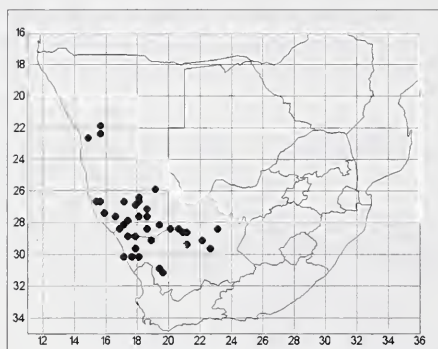
Trees with trunks ± 3.0–4.5 m tall in adult specimens 116a. var. *dichotoma*
 Shrubs with many stems from ground level 116b. var. *ramosissima*

116a. var. **dichotoma**.

Description as for species.

Found in Namibia and the Northern Cape. Trees of this species are usually solitary, but in at least three localities they form sparse 'forests'. Map 83.

The erect inflorescence is the most reliable character separating this species from *A. pillansii* (no. 117). The trunks of this species tend to be larger in diameter than those of *A. pillansii*; hence the common names used in the Richtersveld for these two species. The branches in *A. dichotoma* tend to be more oblique than

MAP 83.—*Aloe dichotoma* var. *dichotoma*

those of *A. pillansii*. The leaves of *A. dichotoma* are somewhat shorter and much narrower than those of *A. pillansii*, but there is little difference between the flowers of the two species.

The specific epithet refers to the manner of branching, in which the growing point divides into two equal parts, and so there are neither main nor lateral branches. The common names *kokerboom* (Afrikaans), quiver tree and *garas* (Nama) are recorded for this species. In the Richtersveld it is known as *die dikke* (Afrikaans), as opposed to *A. pillansii*, which is called *die lange* (Afrikaans) (Palmer & Pitman 1972).

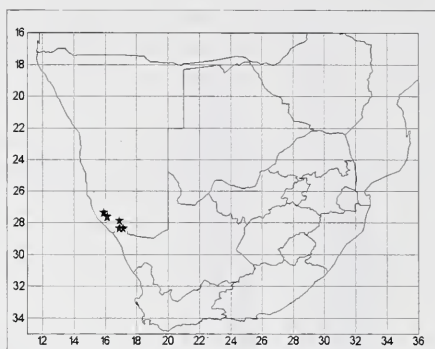
Vouchers: *Dinter 5187* (BOL, PRE); *Hardy 334* (PRE, SRGH); *Leistner 3384* (PRE); *Reynolds 5411* (PRE, SAM); *Thompson 419* (PRE, STE).

116b. var. ***ramosissima*** (Pillans) Glen & D.S.Hardy, comb. et stat. nov.

Type: Northern Cape, Richtersveld, *Reynolds 2547* (BOL, holo.!, PRE!).

A. ramosissima Pillans in *Journal of South African Botany* 5: 66 (1939); Reynolds: 486 (1950); Jeppe: 56 (1969); Sölch, Roessler & Merxm.: 18 (1970); Bornman & D.S.Hardy: 275 (1972); Palmer & Pitman: 391 (1972); Jankowitz: 42 (1975); B.-E. van Wyk & G.F.Sm.: 38 (1996).

Large shrubs branching at or near ground level. *Leaves* fewer per rosette than in var.

MAP 84.—*Aloe dichotoma* var. *ramosissima*

dichotoma, 150–200 mm long. *Seeds* $\pm 14 \times 7 \times 2$ mm. Other characters as in var. *dichotoma*.

Occurs in Namibia and the Northern Cape. Map 84.

Typical plants of this variety branch copiously from ground level, whereas typical plants of var. *dichotoma* branch only 1–2 m above ground level. The leaves of this variety are slightly smaller than those of var. *dichotoma*. There are no differences in flower and inflorescence characters between the two varieties. In the northern Richtersveld and even more so in the Sperrgebiet of Namibia the two varieties recognised here grade into each other.

The varietal epithet means ‘very much branched’.

Vouchers: *Giess 14379* (PRE); *Muller 747* (PRE); *Pillans 5505* (BOL); *Reynolds 5411* (PRE, SAM); *Roux 540* (BOL).

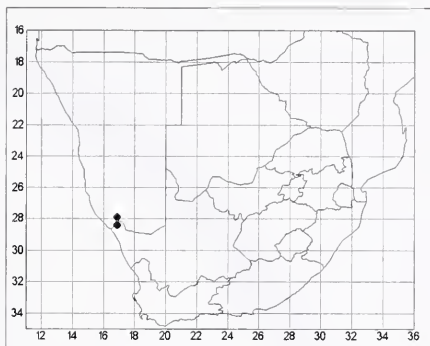
117. ***Aloe pillansii*** L.Guthrie in *Journal of Botany, British and Foreign* 66: 15 (1928); Pillans: 36 (1935); Reynolds: 494 (1950); A.G.J.Herre: 203 (1967); Jeppe: 58 (1969); Sölch, Roessler & Merxm.: 18 (1970); Bornman & D.S.Hardy: 279 (1972); Palmer & Pitman: 396 (1972); Jankowitz: 40 (1975);

B.-E. van Wyk & G.F.Sm.: 34 (1996). Type: Northern Cape, Cornell's Kop, *Pillans 5012* (BOL!).

Trees 10–12 m or more tall, sparsely branched. *Leaves* many per rosette, 350–600 × 100–120 mm, shallowly biconvex to shallowly channelled, grey-green to brownish green. *Inflorescence* lateral, pendent, with up to 50 racemes; these oblique to erect, lax to subdense; bracts filiform, 3–6 mm long. *Flowers* lemon-yellow to butter-yellow, 25–35 mm long; outer segments connate for 7–10 mm, inner segments free; pedicels 7–15 mm long. *Anthers* exserted 7–10 mm. *Ovary* 6–7 × 2–6 mm, pale green; style exserted 12–20 mm. *Fruit* 24–50 × 18–25 mm, pale buff. *Seeds* buff, ± 14 × 7 × 2 mm, including a broad wing. *Flowering time* September to October.

Aloe pillansii is restricted to stony hillsides almost devoid of soil in succulent karoo at low altitude in the Richtersveld and adjacent parts of Namibia. In Namibia it seems to be an indicator of heavy-metal soils. Map 85.

Differences between this species and *A. dichotoma* (no. 116) are dealt with under that species.



MAP 85.—*Aloe pillansii*

The specific epithet honours Mr N.S. Pillans (1884–1964), who collected the type specimen. This species is one of many discovered by Pillans in the course of two expeditions to the Richtersveld, in 1924 and 1926. Pillans's aloe is known in the Richtersveld as *die lange* (Afrikaans), as opposed to *A. dichotoma*, which is called *die dikke* (Afrikaans) (Palmer & Pitman 1972).

Vouchers: *Hardy 2624* (PRE); *Leistner 3472* (PRE); *Reynolds 4770* (BM, PRE); *Rodin 1583* (BOL, K, MO, PRE); *Werdermann & Oberdieck 609* (B, K, PRE).

25. Section *Aloidendron*

Section ***Aloidendron*** *A.Berger* in *Botanische Jahrbücher* 36: 48 (1905a); *A.Berger*: 319 (1908); *Reynolds*: 498 (1950). Type species: *A. barberae* T.-Dyer.

Trees 10–18 m tall, copiously dichotomously branched. *Leaves* ± 20 per rosette, spreading to recurved, ensiform, 400–900 × 32–90 mm, deeply channelled, dark green, unspotted, margins cartilaginous, with small remote teeth. *Inflorescence* a 3-branched panicle 400–600 mm tall, of cylindric, dense racemes, without sterile bracts below branches; bracts linear, twisted, ± 6–10 × 1 mm. *Flowers* pink to blood-red, 25–37 mm long, cylindric; outer segments free almost to base, inner segments free; pedicels 6–10 mm long. *Anthers* exserted 8–15 mm. *Ovary* ± 8 × 6 mm, pale olive-green; style exserted 6–20 mm. *Fruit* not seen.

118. ***Aloe barberae*** T.-Dyer in *The Gardeners' Chronicle* 1: 568 (1874); T.-Dyer: 90 (1875a); T.-Dyer: 49 (1875b); B.-E. van Wyk & G.F.Sm.: 30 (1996). Type: Hort., *Anon. s.n.* (K!).

A. bainesii T.-Dyer: 568 (1874); Baker: t. 6848 (1885); Baker: 326 (1896a); A.Berger: 319 (1908); Marloth: 92 (1915); Sim: 152 (1919); Reynolds: 498 (1950); Jeppe: 59 (1969); Bornman & D.S.Hardy: 281 (1972); Palmer & Pitman: 399 (1972); Compton: 98 (1976). Type: KwaZulu-Natal, Greytown dist., *T. Baines s.n.* (K!).



FIGURE 25.—Section *Aloidendron*. *Aloe barberae*: 1, habit; 2, leaf, $\times 0.4$; 3, peduncle, slightly reduced; 4, raceme, slightly reduced; 5, flower, $\times 0.7$; 6, longitudinal section of flower, $\times 0.7$. Taken from Baker (1885).

A. bainesii T.-Dyer var. *barberae* (T.-Dyer) Baker: 326 (1896a).

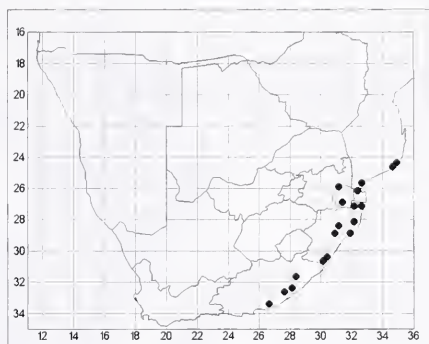
Description as for section. *Flowering time* May to June. Figure 25.

Aloe barberae is found in Mpumalanga, Swaziland, KwaZulu-Natal and the Eastern Cape; also in Mozambique. It typically grows in dry forest. The tallest specimens occur in the Lebombo foothills near the KwaZulu-Natal-Mozambique-Swaziland border; those with the greatest diameter occur near Grahamstown. Map 86.

Thiselton-Dyer reduced his *A. bainesii* to synonymy under *A. barberae* the year after he published both names (Thiselton-Dyer 1875a). This paper seems to have been ignored by all subsequent workers dealing with this species. As there are no grounds for challenging Thiselton-Dyer's decision, it is necessary to discard the well-known name for this species in favour of the less familiar one (Smith, Van Wyk & Glen 1994).

The form of the inflorescence varies, being either capitate or conical, and the flower colour is either salmon-orange or strawberry-pink. These characters have caused a number of enthusiasts to raise the possibility of recognising two varieties, but it appears that in northern Zululand and southern Mozambique both forms grow together, and it is doubtful whether they would breed true (L.C. Leach pers. comm.).

The tallest species of *Aloe* in southern Africa, *A. barberae* bears a superficial resemblance to *A. eminens*, which occurs in northern Somalia. *A. eminens* is not as tall as *A. barberae* and has smaller leaves, shorter racemes, larger bracts and more shortly exerted stamens and styles. There are also differences in the microscopical structure of the leaf epidermis in the two species. *A. barberae* could hardly be con-



MAP 86.—*Aloe barberae*

fused with *A. dichotoma* (no. 116) or *A. pillansii* (no. 117), as its bright green, deeply channelled leaves are much larger than the leaves of either of those two species. *A. barberae* has erect, dense racemes of pink, not yellow, flowers and the flowers are not as fleshy as those of either *A. dichotoma* or *A. pillansii*. This species grows readily from truncheons, something that species in section *Dracoaloe* will not do at all.

The specific epithet honours Mrs Mary Elizabeth Barber, who introduced the species to British horticulture. The Baines commemorated in the synonym is Thomas Baines, the artist and explorer. Many common names are recorded for this species, including the following: tree aloe, *mikaalwyn*, *boomaalwyn* (both Afrikaans), *inkalane enknh*, *nnngxwala*, *indlabendlazi* and *impondondo* (all Zulu) (Palmer & Pitman 1972). The Ronga common name *xiteti* is recorded on the specimen Mogg 30900 (J, K).

Vouchers: *Balkwill & Cron 360* (J, PRE); *Compton 27976* (NBG); *Flanagan 1329* (BOL, SAM); *Reynolds 5378* (BM, PRE); *Ward 2636* (NH, PRE).

26. Section **Kumara**

Section **Kumara** (*Medik.*) Baker in Journal of the Linnean Society of London, Botany 18: 155 (1880a); Baker: 305 (1896a); Reynolds: 502 (1950). Type species: *A. plicatilis* (L.) Mill.

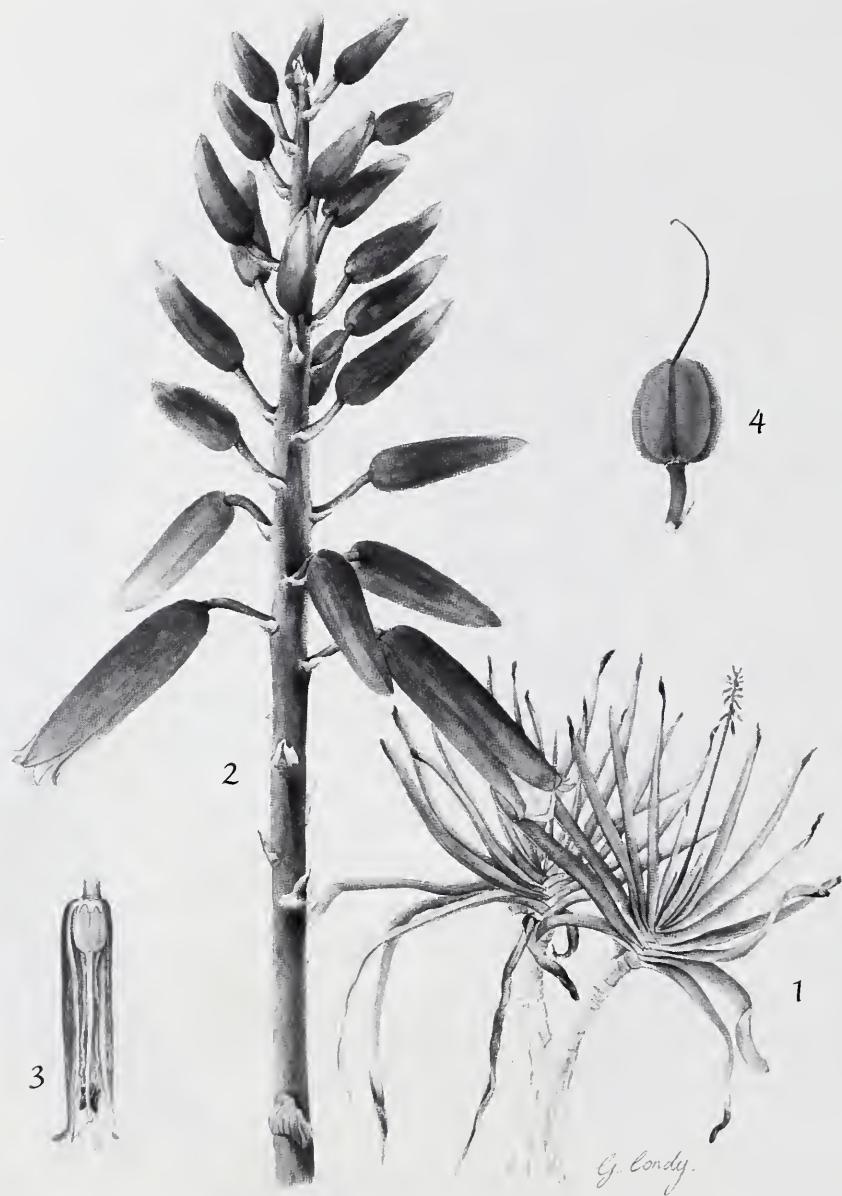


FIGURE 26.—Section Kumara. *Aloe plicatilis*: 1, habit, much reduced; 2, inflorescence, $\times 0.8$; 3, half-flower, $\times 0.8$; 4, unripe fruit, $\times 0.8$. Taken from Glen (1988).

Kumara Medik.: 74 (1786) pro genus.

Small trees or large shrubs up to ± 4 m tall; stems much-branched. *Leaves* ± 16 –20 per branch, distichous, lorate, obtuse, $\pm 300 \times 35$ mm, blue-grey-green, margins entire or with minute dark maroon-brown teeth. *Inflorescence* racemose, lax; bracts $\pm 7 \times 4$ mm. *Flowers* scarlet, 35–45 mm long; pedicels 7–11 mm long. *Anthers* exserted 1–2 mm. *Ovary* green, $\pm 8 \times 7$ mm; style exserted 2–5 mm. *Fruit* pale buff, $\pm 20 \times 16$ mm. *Seeds* winged, dark brown to black.

119. **Aloe plicatilis** (L.) Mill., The garden-er's dictionary: no. 7 (1768); Aiton: 470 (1789); Willd.: 190 (1799); Curtis: t. 457 (1799); DC.: t. 75 (1801); W.T.Aiton: 296 (1811); Haw.: 74 (1812); Salm-Dyck: 28, t. 2 (1849); Baker: 328 (1896a); A.Berger: 322 (1908); Marloth: 93 (1915); Reynolds: 502 (1950); Jeppe: 67 (1969); Bornman & D.S.Hardy: 283 (1972); Palmer & Pitman: 400 (1972); Glen: t. 1972 (1988); B.-E. van Wyk & G.F.Sm.: 36 (1996). Iconotype: *Aloe africana arborescens montana non spinosa, folio longissimo plicatili, flore rubro* J.Commelijn. Horti medici Amstelaedamensis 2: 5, t. 3 (1701).

A. disticha L. var. *plicatilis* L.: 321 (1753); Burm.f.: 10 (1768). *Rhipidodendron plicatile* (L.) Haw.: 45 (1821).

A. linguaeformis L.f.: 206 (1782). Type: Cape of Good Hope, Thunberg 8590 (UPS, holo.; PRE, photo.).

A. tripetala Medik.: 55 (1783). Type: not cited.

A. lingua Thunb.: 7 (1785); Aiton: 469 (1789); Thunb.: 61 (1794); Thunb.: 183 (1800); Thunb.: 312 (1823); N.E.Br.: 141 (1923). Type: South Africa, no precise locality, Thunberg 8590 (UPS, holo.; PRE, photo.).

Kumara disticha Medik.: 70, t. 4 (1786). *Rhipidodendron distichum* (Medik.) Willd.: 165 (1811). Type: not cited.

A. flabelliformis Salisb.: 246 (1796). Type: not cited.

A. plicatilis (L.) Mill. var. *major* Salm-Dyck: 30 (1817); A.Berger: 324 (1908). Type: not cited.

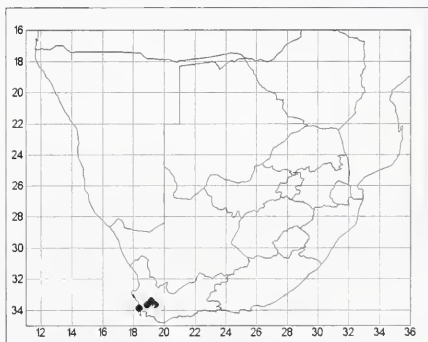
Description as for section. *Flowering time* August to October. Figure 26.

Aloe plicatilis is endemic to the Western Cape where it occurs on Table Mountain sandstone mountains in areas of very high winter rainfall, among fynbos. Map 87.

The distichous, glaucous, linear, obtuse leaves of this species recall those of *A. haemanthifolia* (no. 23), but there are no grounds for confusing the two. *A. plicatilis* is a large, dichotomously branching shrub or small tree, and the leaves are much smaller than those of *A. haemanthifolia* and without fibres. The raceme is lax and cylindric, not dense and capitate, the pedicels are shorter and the flowers both longer and broader than in *A. haemanthifolia*.

The Latin word *plicatilis* means flexible or able to be folded. The earliest figure of this species shows a plant with distinctly floppy leaves (Commelijn 1701). Common names for this species include fan aloe, French Hoek aloe, waaieraalwyn and Franschoekaalwee (both Afrikaans) (Palmer & Pitman 1972).

Vouchers: *Compton 13849* (NBG); *MacOwan 2259* (K, STE); *Marloth 5144* (PRE); *Reynolds 3533* (PRE); *Van der Merwe 1192* (PRE).



MAP 87.—*Aloe plicatilis*

Species insufficiently known

A. brownii Baker: 44 (1889a); Reynolds: 386 (1950). Type not explicitly cited. This is an unknown species.

A. chloroleuca Baker: 38 (1877a); Reynolds: 427 (1950). This is a hybrid, probably with *A. speciosa* as one parent.

A. cinnabarina Diels ex A. Berger: 65 (1905a); Reynolds: 369 (1950). Type: Mpumalanga, Lydenburg, *Wilus 1480* (B†). This is an unknown species.

A. commutata Tod.: 75, t. 28 (1876); Reynolds: 293 (1950). This is probably *A. maculata* × *A. grandidentata*.

A. consobrina Salm-Dyck: 18, t. 3 (1863); Reynolds: 370 (1950). Lecto-iconotype: Salm-Dyck: 18, t. 3 (1863), here designated. This is possibly a hybrid of unknown parentage.

A. corifolia Pillans: 24 (1934b); Reynolds: 339 (1950). Type: Eastern Cape, Willowmore, *Nel SUG5070* (BOL!). This is probably a hybrid of unknown parentage.

A. deflexidens Pillans: 36 (1935); Reynolds: 292 (1950). Type: KwaZulu-Natal, Zululand, *Struben NBG853/31* (NBG!). This is either an unusual form of *A. maculata* or a hybrid between that species and *A. grandidentata*.

A. drepanophylla Baker: 814 (1875); Reynolds: 427 (1950). This is a hybrid, probably with *A. speciosa* as one parent.

A. gasterioides Baker: 166 (1880a); Reynolds: 291 (1950). Type not explicitly cited. This is an unknown species.

A. grahamii Schönland: 39 (1903); Reynolds: 292 (1950). Type: Hort., *Schönland s.n.* (GRA!). This is a hybrid, probably with *A. maculata* as one parent.

A. heteracantha Baker: 161 (1880a); Reynolds: 291 (1950). Type not explicitly cited. This is probably *A. maculata* × *A. arborescens*.

A. hexapetala Salm-Dyck: 28 (1817); Reynolds: 427 (1950). Type not cited. This is a hybrid, probably with *A. speciosa* as one parent.

A. longiflora Baker: 756 (1888); Reynolds: 427 (1950). Type not cited. This is possibly a hybrid of unknown parentage.

A. monteiroi Baker: 523 (1889b); Reynolds: 368 (1950). Type: Mozambique, Delagoa Bay, *Monteiro s.n.* (K). This is *A. parvibracteata* × some other species of *Aloc*.

A. nobilis Haw.: 78 (1812); Reynolds: 385 (1950). Type not cited. This is probably *A. arborescens* × *A. perfoliata*.

A. obscura A. Berger ex Schönland: 287 (1905a) non Mill. Type: Hort. La Mortola, *Berger s.n.* (GRA!). This is a hybrid. One parent is almost certainly *A. maculata*; the other is possibly *A. ferox* or a related species.

A. obscura Mill.: no. 6 (1768); Reynolds: 289 (1950). Type not cited. This may be a form of *A. maculata*.

A. picta Thunb.: 4 (1785). Type not cited. This may be a form of *A. maculata*.

A. runcinata A. Berger: 205 (1908); Reynolds: 292 (1950). Type: Hort. La Mortola, *Berger s.n.*

A. serrulata (Aiton) Haw.: 18 (1804); Reynolds: 213 (1950). *A. perfoliata* L. var. *serrulata* Aiton: 467 (1789). Type not cited. This is probably *A. variegata* × *A. maculata*.

A. sigmoidea Baker: 177 (1880a); Reynolds: 485 (1950). Type: Eastern Cape, Kaffraria, *Cooper s.n.* (K). This appears to be a hybrid with *A. arborescens* as one parent.

A. sororia A. Berger: 280 (1908); Reynolds: 386 (1950). Type: Hort. La Mortola, *Berger s.n.* This is an unknown species.

A. spuria A. Berger: 214 (1908); Reynolds: 292 (1950). Type: Hort. La Mortola, *Berger s.n.* This is a hybrid, probably with *A. maculata* as one parent.

A. stans A. Berger: 279 (1908); Reynolds: 385 (1950). Type: Eastern Cape, Bethelsdorp, *Drège 8633*. This is an unknown species.

A. tricolor Baker: t. 6324 (1877b). Iconotype: Baker: t. 6324 (1877b). This is probably *A. maculata* × *A. grandidentata*.

A. virens Haw.: 17 (1804); Reynolds: 172 (1950). Type not cited. This is possibly a hybrid of unknown parentage.

Species excluded

The nomenclature of *Gasteria* follows Van Jaarsveld (1994). The nomenclature of *Haworthia* species mostly follows Bayer (1982), but Scott's (1985) opinion is also quoted in some cases.

A. acinacifolia J. Jacq. = *Gasteria acinacifolia* (J. Jacq.) Haw.

A. albicans Haw. = *Haworthia marginata* (Lam.) Stearn (= *H. albicans* (Haw.) Haw.).

A. altilinea (Haw.) Schult. & Schult. f. = *Haworthia altilinea* Haw. Bayer (1982) considers this to be a *nomen confusum*, but Scott (1985) accepts it as a good species.

A. angulata Willd. = *Gasteria carinata* (Mill.) Duval (= *G. angulata* (Willd.) Haw.).

A. angustifolia (Aiton) Salm-Dyck. = *Gasteria disticha* (L.) Haw. (= *G. angustifolia* (Aiton) Haw.).

- A. arachnoides* Thunb. = *Haworthia arachnoidea* (L.) Duval.
- A. asperinscula* (Haw.) Schult. & Schult.f. = *Haworthia viscosa* (L.) Haw. (= *H. asperiuscula* Haw.).
- A. atrovirens* DC. = *Haworthia herbacea* (Mill.) Stearn (= *H. atrovirens* (DC.) Haw.).
- A. attenuata* Haw. = *Haworthia attenuata* (Haw.) Haw.
- A. bayfieldii* Salm-Dyck = a hybrid between *Gasteria* sp. and *Haworthia* sp.
- A. bicarinata* (Haw.) Schult. & Schult.f. = *Astroloba bicarinata* (Haw.) Uitewaal.
- A. bicolor* (Haw.) Schult. & Schult.f. = *Gasteria bicolor* Haw.
- A. boureana* Schult. & Schult.f. = *Gasteria bicolor* Haw.
- A. bowieana* Salm-Dyck = *Gasteria bicolor* Haw.
- A. brachyphylla* Salm-Dyck. = *Gasteria brevifolia* Haw.
- A. bradlyana* Jacq. = *Haworthia herbacea* (Mill.) Stearn (= *H. atrovirens* (DC.) Haw.).
- A. bullulata* Jacq. = *Astroloba bullulata* (Jacq.) Uitewaal.
- A. candicans* (Haw.) Schult. & Schult.f. = *Gasteria acinacifolia* (Jacq.) Haw. (= *G. candicans* Haw.).
- A. carinata* Mill. = *Gasteria carinata* (Mill.) Duval.
- A. chloracantha* (Haw.) Schult. & Schult.f. = *Haworthia chloracantha* Haw.
- A. coarctata* (Haw.) Schult. & Schult.f. = *Haworthia coarctata* Haw.
- A. concinna* Schult. & Schult.f. = *Haworthia viscosa* (L.) Haw. (= *H. viscosa* (L.) Haw. var. *concinna* (Schult. & Schult.f.) Baker).
- A. congesta* Salm-Dyck = *Astroloba congesta* (Salm-Dyck) Uitewaal.
- A. conspurcata* Salm-Dyck = *Gasteria disticha* (L.) Haw. (= *G. conspurcata* (Salm-Dyck) Haw.).
- A. cordifolia* (Haw.) Schult. & Schult.f. = *Haworthia viscosa* (L.) Haw. (= *H. cordifolia* Haw.).
- A. crassifolia* (Haw.) Schult. & Schult.f. = *Gasteria disticha* (L.) Haw.
- A. croucheri* Hook.f. = *Gasteria croucheri* (Hook.f.) Baker.
- A. cuspidata* (Haw.) Schult. & Schult.f. = *Haworthia cuspidata* Haw., a name which Bayer (1982) rejects, apparently as a *nomen confusum*. Scott in one place (1985: 91) regards this as a synonym of *H. cymbiformis* (Haw.) Duval and in another (1985: 143) treats it as a plant of hybrid origin.
- A. cylindracea* Lam. = *Haworthia* sp. or *Astroloba spiralis* (L.) Uitewaal.
- A. cymbaefolia* Schrad. = *Haworthia cymbiformis* (Haw.) Duval.
- A. cymbiformis* Haw. = *Haworthia cymbiformis* (Haw.) Duval.
- A. decipiens* (Haw.) Schult. & Schult.f. = *Gasteria nitida* (Salm-Dyck) Haw. (= *G. decipiens* Haw.).
- A. deltoidea* Hook.f. = *Astroloba deltoidea* (Hook.f.) Uitewaal.
- A. denticulata* (Haw.) Schult. & Schult.f. = *Haworthia denticulata* Haw., which is not known in nature, according to Bayer (1982). Scott (1985) treats it as a synonym of *H. aristata* Haw.
- A. dictyodes* Schult. & Schult.f. = *Gasteria bicolor* Haw.
- A. disticha* (Haw.) Schult. & Schult.f. = *Gasteria disticha* (L.) Haw.
- A. disticha* L. = *Gasteria carinata* (Mill.) Duval var. *verrucosa* (Mill.) Van Jaarsv. partly.
- A. elongata* Salm-Dyck = *Gasteria trigona* Haw., an ambiguous name.
- A. ensifolia* (Haw.) Schult. & Schult.f. = *Gasteria acinacifolia* (Jacq.) Haw.
- A. excavata* Willd. = *Gasteria carinata* (Mill.) Duval (= *G. excavata* (Willd.) Haw.).
- A. fasciata* (Willd.) Salm-Dyck in Schult. & Schult.f. = *Haworthia fasciata* (Willd.) Haw.
- A. foliolosa* Haw. = *Astroloba foliolosa* (Haw.) Uitewaal.
- A. formosa* Schult. & Schult.f. = *Gasteria brachyphylla* (Salm-Dyck) Van Jaarsv.
- A. glabra* (Haw.) Salm-Dyck = *Gasteria carinata* (Mill.) Duval.
- A. glabrata* Salm-Dyck = *Haworthia glabrata* (Salm-Dyck) Baker.
- A. granata* Schult. & Schult.f. = *Haworthia pumila* (L.) Duval.
- A. guttata* Salm-Dyck = *Gasteria subnigricans* Haw. var. *glabrior* Haw., a name of no certain application.
- A. liebes* Schult. & Schult.f. = *Haworthia cymbiformis* (Haw.) Duval. var. *cymbiformis* (= *H. cymbiformis* (Haw.) Duval var. *obtus* (Haw.) Haw.).
- A. herbacea* DC. = *Haworthia reticulata* (Haw.) Haw.
- A. holzkei* Radl = *Gasteria carinata* (Mill.) Duval var. *verrucosa* (Mill.) Van Jaarsv. × *Haworthia radula* (Jacq.) Haw.

- A. hyacinthoides* L. = *Sansevieria zeylanica* Willd.
- A. hybrida* Salm-Dyck = *Haworthia hybrida* (Salm-Dyck) Haw. Bayer (1982) rejects this name without comment; Scott (1985) regards it as possibly a garden hybrid.
- A. imbricata* Haw. = *Astroloba spiralis* (L.) Uitewaal.
- A. indurata* Schult. & Schult.f. = *Haworthia viscosa* (L.) Haw. (= *H. viscosa* (L.) Haw. var. *indurata* (Haw.) Baker).
- A. intermedia* Haw. = *Gasteria carinata* (Mill.) Duval var. *verrucosa* (Mill.) Van Jaarsv.
- A. laetepuncta* (Haw.) Schult. & Schult.f. = *Gasteria carinata* (Mill.) Duval.
- A. laetevirens* (Haw.) Link = *Haworthia turgida* Haw. (= *H. laetevirens* Haw.).
- A. laevigata* Schult. & Schult.f. = *Haworthia marginata* (Lam.) Stearn.
- A. lauchei* Radl = *Gasteria carinata* (Mill.) Duval var. *verrucosa* (Mill.) Van Jaarsv. × *G. pulchra* (Aiton) Haw.
- A. lingua* Ker Gawl. = *Gasteria bicolor* Haw.
- A. lingua* Thunb. var. *angustifolia* Aiton = *Gasteria disticha* (L.) Haw.
- A. longifolia* Lam. = *Kniphofia uvaria* (L.) Oken.
- A. longifolia* Haw. = *Gasteria disticha* (L.) Haw.
- A. maculata* Ker Gawl. = *Gasteria pulchra* (Aiton) Haw.
- A. maculata* Thunb. = *Gasteria bicolor* Haw.
- A. maculata* Thunb. var. *pulchra* Aiton = *Gasteria pulchra* (Aiton) Haw.
- A. margaritifera* Burm.f. = *Haworthia pumila* (L.) Duval.
- A. marginata* Lam. = *Haworthia marginata* (Lam.) Stearn.
- A. minor* Schult. & Schult.f. = *Haworthia pumila* (L.) Duval.
- A. mirabilis* Haw. = *Haworthia mirabilis* (Haw.) Haw.
- A. mollis* (Haw.) Schult. & Schult.f. = *Gasteria disticha* (L.) Haw. (= *G. mollis* Haw.).
- A. multifaria* (Haw.) Schult. & Schult.f. = *Haworthia multifaria* Haw., which Bayer (1982) considers to be probably a form of *H. reusa* (L.) Duval. Scott (1985) places *Haworthia multifaria* Haw. into synonymy under *H. mirabilis* (Haw.) Haw.
- A. nigra* (Haw.) Schult. & Schult.f. = *Haworthia nigra* (Haw.) Baker.
- A. nigricans* Haw. = *Gasteria disticha* (L.) Haw.
- A. nigricans* Haw. var. *fasciata* Salm-Dyck = *Gasteria fasciata* (Salm-Dyck) Haw., an ambiguous name.
- A. nitens* (Haw.) Schult. & Schult.f. = *Gasteria acinacifolia* (Jacq.) Haw.
- A. nitida* Salm-Dyck = *Gasteria nitida* (Salm-Dyck) Haw.
- A. nitida* Salm-Dyck var. *obtusata* Salm-Dyck = *Gasteria nitida* (Salm-Dyck) Haw.
- A. obliqua* DC. = *Gasteria pulchra* (Aiton) Haw.
- A. obliqua* Haw. = *Gasteria bicolor* Haw.
- A. obliqua* Jacq. = *Gasteria disticha* (L.) Haw.
- A. obscura* Willd. = *Gasteria carinata* (Mill.) Duval.
- A. obtusa* (Salm-Dyck) Schult. & Schult.f. = *Gasteria nitida* (Salm-Dyck) Haw.
- A. obtusifolia* Salm-Dyck = *Gasteria disticha* (L.) Haw.
- A. pallida* (Haw.) Schult. & Schult.f. = *Haworthia herbacea* (Mill.) Stearn (= *H. pallida* Haw.).
- A. papillosa* Salm-Dyck = *Haworthia pumila* (L.) Duval (= *H. papillosa* (Salm-Dyck) Haw.).
- A. parva* Schult. & Schult.f. = *Haworthia venosa* (Lam.) Haw. subsp. *tessellata* (Haw.) M.B. Bayer (= *H. tessellata* Haw. var. *parva* (Schult. & Schult.f.) Baker).
- A. pellucens* Haw. = *Haworthia translucens* (W.T. Aiton) Haw. subsp. *translucens* (= *H. pellucens* (Haw.) Haw.).
- A. pentagona* Haw. = *Astroloba pentagona* (Haw.) Uitewaal.
- A. planifolia* (Haw.) Schult. & Schult.f. = *Haworthia cymbiformis* (Haw.) Duval var. *cymbiformis* (= *H. planifolia* Haw.).
- A. pseudangulata* Salm-Dyck = *Gasteria carinata* (Mill.) Duval.
- A. pseudonigricans* Salm-Dyck = *Gasteria subnigricans* Haw., a name of doubtful application.
- A. pseudorigida* Salm-Dyck = *Haworthia tortuosa* (Haw.) Haw. var. *pseudorigida* (Salm-Dyck) A. Berger, a name which Bayer (1982) rejects without comment. Scott (1985) was unable to trace specimens of this.
- A. pseudotortuosa* Salm-Dyck = *Haworthia viscosa* (L.) Haw. (= *H. viscosa* (L.) Haw. var. *pseudotortuosa* (Salm-Dyck) Baker).
- A. pulchra* (Aiton) Jacq. = *Gasteria pulchra* (Aiton) Haw.
- A. pumila* L. var. *margaritifera* L. = *Haworthia pumila* (L.) Duval.
- A. pumilio* Jacq. = *Haworthia* sp.
- A. racemosa* Lam. = *Gasteria carinata* (Mill.) Duval var. *verrucosa* (Mill.) Van Jaarsv.
- A. radula* Jacq. = *Haworthia radula* (Jacq.) Haw.
- A. radula* Ker Gawl. = *Haworthia attenuata* (Haw.) Haw.
- A. recurva* Haw. = *Haworthia venosa* (Lam.) Haw. subsp. *venosa* (= *H. recurva* (Haw.) Haw.).
- A. reinwardtii* Salm-Dyck = *Haworthia reinwardtii* (Salm-Dyck) Haw.
- A. repens* Schult. & Schult.f. = *Gasteria carinata* (Mill.) Duval var. *verrucosa* (Mill.) Van Jaarsv.
- A. reticulata* Haw. = *Haworthia reticulata* (Haw.) Haw.

A. retusa L. = *Haworthia retusa* (L.) Duval.

A. rigida DC. = *Haworthia rigida* (Lam.) Haw., which Bayer (1982) considers to be of hybrid origin. Scott (1985) could not trace any material of this.

A. rigida Jacq. = *Haworthia tortuosa* (Haw.) Haw. var. *pseudorigida* (Salm-Dyck) A. Berger, which Bayer (1982) rejects without comment. Scott (1985) could not trace any material of this.

A. rigida Salisb. = *Kniphofia uvaria* (L.) Oken.

A. rugosa Salm-Dyck in Schult. & Schult.f. = *Haworthia rugosa* (Salm-Dyck) Baker, which Bayer (1982) rejects without comment. Scott (1985) places the name in synonymy under *H. radula* (Jacq.) Haw.

A. scaberrima Salm-Dyck. = *Gasteria carinata* (Mill.) Duval var. *verrucosa* (Mill.) Van Jaarsv.

A. scabra (Haw.) Schult. & Schult.f. = *Haworthia scabra* Haw.

A. semiglabrata (Haw.) Schult. & Schult.f. = *Haworthia pumila* (L.) Duval (= *H. semiglabrata* Haw.).

A. semimargaritifera Salm-Dyck. = *Haworthia pumila* (L.) Duval.

A. setosa Schult. & Schult.f. = *Haworthia arachnoidea* (L.) Duval (= *H. setata* Haw.).

A. sordida (Haw.) Schult. & Schult.f. = *Haworthia sordida* Haw.

A. spiralis Haw. = *Astroloba pentagona* (Haw.) Uitewaal var. *willdenowii* (Baker) Uitewaal.

A. spiralis L. = *Astroloba spiralis* (L.) Uitewaal.

A. stenophylla Schult. & Schult.f. = *Haworthia angustifolia* Haw.

A. subattenuata Salm-Dyck in Schult. & Schult.f. = *Haworthia subattenuata* (Salm-Dyck) Haw., a name which Bayer (1982) rejects without comment. Scott (1985) could not trace any material of this.

A. subcarinata Haw. = *Gasteria carinata* (Mill.) Duval.

A. subfasciata Salm-Dyck in Schult. & Schult.f. = *Haworthia subfasciata* (Salm-Dyck) Baker, a name which Bayer (1982) rejects without comment. Scott (1985) could not trace any material of this.

A. subnigricans (Haw.) Spreng. = *Gasteria subnigricans* Haw., a name of uncertain application.

A. subrigida Schult. & Schult.f. = *Haworthia tortuosa* (Haw.) Haw. var. *pseudorigida* (Salm-Dyck) A. Berger, a name which Bayer (1982) rejects without comment. Scott (1985) could not trace any material of this.

A. subtortuosa Schult. & Schult.f. = *Haworthia viscosa*

(L.) Haw. (= *H. viscosa* (L.) Haw. var. *pseudotortuosa* (Salm-Dyck) Baker).

A. subulata Salm-Dyck in Schult. & Schult.f. = *Haworthia subulata* (Salm-Dyck) Baker, a name which Bayer (1982) rejects without comment. Scott (1985: 19) places it in synonymy under *H. radula* (Jacq.) Haw., but elsewhere (1985: 149) excludes it from the genus as he could not trace any material of it.

A. subverrucosa Salm-Dyck = *Gasteria carinata* (Mill.) Duval var. *verrucosa* (Mill.) Van Jaarsv.

A. sulcata Salm-Dyck = *Gasteria carinata* (Mill.) Duval.

A. tessellata (Haw.) Schult. & Schult.f. = *Haworthia venosa* (Lam.) Haw. subsp. *tessellata* (Haw.) M.B. Bayer.

A. torquata Salm-Dyck: = *Haworthia viscosa* (L.) Haw. (= *H. viscosa* (L.) Haw. var. *torquata* (Salm-Dyck) Baker).

A. tortuosa Haw. = *Haworthia tortuosa* (Haw.) Haw., a name which Bayer (1982) rejects without comment. Scott (1985) speculates that it may be placed in synonymy under *H. viscosa* (L.) Haw. or *H. nigra* (Haw.) Baker.

A. translucens W.T. Aiton = *Haworthia translucens* (W.T. Aiton) Haw. subsp. *translucens*.

A. tricolor Haw. = *Haworthia venosa* (Lam.) Haw.

A. trigona (Haw.) Schult. & Schult.f. = *Gasteria trigona* Haw., a name of uncertain application.

A. trigona Salm-Dyck = *Gasteria nitida* (Salm-Dyck) Haw.

A. tristicha Medik. = *Gasteria carinata* (Mill.) Duval.

A. turgida (Haw.) Schult. & Schult.f. = *Haworthia turgida* Haw.

A. uvaria L. = *Kniphofia uvaria* (L.) Oken.

A. venosa Lam. = *Haworthia venosa* (Lam.) Haw.

A. venusta (Haw.) Schult. & Schult.f. = *Gasteria acinacifolia* (Jacq.) Haw.

A. verrucosa Mill. = *Gasteria carinata* (Mill.) Duval var. *verrucosa* (Mill.) Van Jaarsv.

A. verrucula Medik. = *Gasteria carinata* (Mill.) Duval var. *verrucosa* (Mill.) Van Jaarsv.

A. virescens (Haw.) Schult. & Schult.f. = *Haworthia marginata* (Lam.) Stearn (= *H. albicans* (Haw.) Haw. var. *virescens* (Haw.) Baker).

A. viscosa L. = *Haworthia viscosa* (L.) Haw.

A. vittata Schult. & Schult.f. = *Gasteria fasciata* (Salm-Dyck) Haw., a name of uncertain application.

A. zeyheri Salm-Dyck. = *Gasteria bicolor* Haw.

A. zeylanica Jacq. = *Sansevieria zeylanica* Willd.

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APPENDIX

PLAN OF *FLORA OF SOUTHERN AFRICA*

Cryptogam volumes will in future not be numbered, but will be known by the name of the group they cover. The number assigned to the volume on Charophyta therefore becomes redundant. Occasional contributions to the *Flora* are published in *Bothalia* under the title *FSA contributions*.

Exotic families are marked with an asterisk.

Published volumes and parts are shown in bold.

INTRODUCTORY VOLUMES

The genera of southern African flowering plants

Vol. 1: Dicotyledons (1975)

Vol. 2: Monocotyledons (1976)

Botanical exploration of southern Africa (1981)

CRYPTOGAM VOLUMES

Charophyta (as Vol. 9 in 1978)

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Fascicle 4: Fabroniaceae, Leskeaceae, Thuidiaceae, Rigodiaceae, Amblystegiaceae, Brachytheciaceae, Entodontaceae, Plagiotheciaceae, Catagoniaceae, Sematophyllaceae, Hypnaceae, Hylacomiaceae, Polytrichaceae

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Pteridophyta (1986)

FLOWERING PLANTS VOLUMES

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Vol. 3: Cyperaceae, Arecaceae, Araceae, Lemnaceae, Flagellariaceae

Vol. 4: Part 1: Restionaceae

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- FSA contributions 10: Trapaceae. B. VERDCOURT. 1998. *Bothalia* 28: 11–14.
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